

SAF MEDICAL CORPS
50TH ANNIVERSARY



OUR LEGACY
OUR FUTURE

The DNA helix on the front cover symbolises our identity as a Medical Corps. As we move through the pages, the DNA unravels to reveal what makes us who we are.

Editor's note

The editorial team is very grateful to have been given the opportunity to work on the MED50 commemorative book. It has been an amazing learning journey, especially in getting to know the rest of the Medical Corps family, past and present. Through the research, our understanding of how we came to be the Medical Corps of today also increased tremendously. We certainly have much to thank our pioneers and seniors for. As we celebrate our legacy, we step forward boldly into the future and continue our quest to Seek, Save and Serve!

Introductory note

The book was designed to start with recapturing the major milestones of the past five decades ("Our Pioneers Rallied to This Call"). The reader is next taken through the SAF Medical Training System ("Our Skills We Share") where the respective medical services will layer their military medicine expertise upon foundational medical training that every serviceman and servicewoman undergoes. The training system ensures that each and every individual, NSF, regular and ORNS servicemen are kept current in these life-saving skills.

In "No Matter When We're Battle Ready", we look at how the SAF Healthcare system has been set up to provide end-to-end healthcare, from medical screening to primary and specialist healthcare provision and finally force health protection. "Bring Care That They Deserve" brings a first person's perspective on the milestone missions as well as the more recent operations from 2012 to 2017.

Military Medicine expertise has evolved with the operational needs of the SAF. Significant advances have been made and in some areas, the Medical Corps is considered a leader in the field at the national level. We remain responsive to SAF's needs and will continue "To Seek and Save and Serve". As a large organisation with valuable operational experience, "We Serve The Best We Can" through supporting large scale National Level events, providing operational medical support to Singapore and the region as well as sharing best practices through collaborations in training and military medicine. It is also through these collaborations that we draw on lessons from our civilian counterparts to enhance operational medical support to the SAF.

As we embark on exciting times ahead, we reflect on what will be the game-changers in frontline medical support in the future. However even with the best hardware, the men and women of the SAF Medical Corps remain our best assets. We must continue to invest in them to keep "The Lifeline of the SAF" strong.

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Verse 1

Our nation called as need arose
For stations in the field
To treat our fallen brothers all
The wounded and the ill

Our pioneers rallied to this call 04

Then thousands joined this band
And soon a new cry could be heard
A ringing through the land

Chorus

Medics all are we
The medics of the field
We serve the wounded and the sick
The brave who will not yield
Our hearts we give

Our skills we share 24

With valor, pride and will

No matter when we're battle ready 42

The medics of the field

Verse 2

The sound of battle in their ears
The wounded lie around
A hundred cries for "MEDIC!" rise
From those upon the ground
We run to heed their every call

Bring care that they deserve 58

Our mission bold
Our purpose clear

To seek and save and serve 80

Verse 3

They come to us by land and sea
They're sent to us by air
The wounded and the dying too
For treatment and for care
By day or night
In war or peace

We serve the best we can 96 **The lifeline of the SAF** 114

We're there for every man

MEDICS OF THE FIELD

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FOREWORD



The SAF Medical Corps plays an important role in the SAF. From pre-enlistment medical screening at the Medical Classification Centre, to the provision of healthcare at our SAF medical centres and medical support during training, exercises and operations, the Medical Corps has always stood at the forefront to ensure the health and safety of our servicemen and women. After 50 years, the Medical Corps remains unwavering in her mission – “To provide excellent and comprehensive health care for our soldiers, to protect their health and to optimise their combat performance in order to enhance the SAF’s operational edge”.

The Medical Corps has strived to improve the quality of healthcare delivered to our people by partnering with and leveraging the capabilities and expertise of the national healthcare system. The Medical Corps has excelled in medical operations, having been deployed for 26 overseas missions in the last 50 years. Closer to home, the Medical Corps has supported national level events such as National Day Parade, Singapore Youth Olympic Games (2010) and Southeast Asian Games (2015). Through these overseas and local operations, the men and women of the Medical Corps have demonstrated professionalism, tenacity, spirit of self-sacrifice

and, undoubtedly, passed on many ‘war’ stories and valuable operational experience to future generations.

As the demographics and the health challenges for the SAF evolve, the SAF Medical Corps must continue to look beyond the horizon for opportunities and emerging technologies to continually improve the standards and delivery of healthcare in the SAF. With the SAF transforming to the next generation fighting force, new medical support concepts will need to be developed to ensure that our people continue to be supported while they train and fight.

I want to congratulate the SAF Medical Corps on your 50th Anniversary and thank you for your sterling service and contributions to the SAF. Continue to be mission ready and provide the best medical care to our soldiers, sailors and airmen!

A handwritten signature in black ink, appearing to read 'Perry'.

Lieutenant-General Perry Lim
Chief of Defence Force
Singapore Armed Forces

PREFACE



The theme for the 50th Anniversary of the SAF Medical Corps, “Our Legacy, Our Future”, was chosen to reflect firstly Our Legacy - the rich heritage and history that the pioneers of the Medical Corps have established and left behind to remind us of our humble beginnings and how we progressed over the last 50 years. The adjoining “Our Future” seeks then to inspire us to look ahead and to build the next generation Medical Corps.

The SAF Medical Corps has grown from a Senior Medical Officer’s Department in 1967, to the three Medical Services (Army, Airforce and Navy) and 3 Medical Commands (Military Medicine Institute, SAF Medical Training Institute and Force Medical Protection Command) of today. As the SAF transformed from the 1st generation to the 3rd generation of today, the services and support provided by the Medical Corps expanded in tandem, in terms of scope and complexity. Today, we stand proud as a world class Medical Corps, providing not just peacetime healthcare and force health protection to the SAF but also operational medical support across the entire spectrum of operations, ensuring mission success for the SAF.

The journey of transformation over the past 50 years was made possible because of the quality of people we had and continue to have in the Medical Corps. I want to pay tribute to our pioneers, on whose shoulders we stand today.


I want to honour the men and women who serve the Corps today, for your contributions and sacrifices will shape the Corps of tomorrow. I want to challenge those who will join our ranks in the years to come, to take over the baton and continue to seek excellence in service to the SAF and to Singapore.

The future of the SAF Medical Corps will be an exciting one. We can look forward to the introduction of new medical technologies, the strengthening of our collaborations with the public healthcare sector and other strategic partners, the development of deep expertise in areas such as paramedicine, nursing and medical training among our Military Medical Experts; just to name a few. These developments are promising and will place the SAF Medical Corps in a strong position to meet the challenges ahead. Let us therefore look to the future with confidence and continue to serve the SAF with honour and pride, for the next 50 years.

Seek, Save, Serve

A handwritten signature in black ink, appearing to read 'Tang Kong Choong'.

RADM(Dr) Tang Kong Choong
Chief of Medical Corps
Singapore Armed Forces



“Those of us who stayed on
had a passion for
what we were doing.”

- 1WO(Ret) Suhumaran
Chief Navy Medic (1993-1999)



OUR PIONEERS
RALLIED TO
THIS CALL

THE JOURNEY OF THE SAF MEDICAL CORPS

- 1888** Singapore Volunteer Artillery (SVA) founded
- 1901** Formation of Ambulance and Bearer Section of the SVA
- 1913** Ambulance and Bearer Section becomes Bearer Company of Singapore Volunteer Corps
- 1915** Providing medical assistance during the mutiny of the Fifth Indian Light Infantry
- 1922** Medical company becomes Singapore Volunteer Field Ambulance
- 1934** Naval Medical Services of The Straits Settlement Volunteer Force established
- 1935** Dental section established in Navy
- 1941** Medical Auxiliary Service provided aid to victims of Japanese bomber attacks during WWII
- 1957** Dr S Ganendran appointed first Commanding Officer (CO) of the Singapore Army Medical Corps
- 1965** Singapore gains independence
- 1966** NS medical screening introduced by Dr Robert Yeo and Dr "Sunny" Williams
Medical Orderlies Training School started by CPT S T Moorthy
Hygiene and Malaria Control Unit established
- 1967** **Birth of the SAF Medical Services.** Establishment of the Senior Medical Officer (SMO) Department headed by Dr Jimmy Choo
Medical store established in SAFTI camp
Pre-enlistee screening commenced at Medical Classification Centre, Kallang Camp
Establishment of Singapore Naval Volunteer Force (SNVF) Medical Centre on Pulau Blakang Mati
- 1968** Dr Roy Paul appointed first CO of School of Military Medicine (SMM)
First batch of combat medical orderly instructors trained
Dr Benny Chan appointed first SAF dental officer
Commencement of Dental Service in SAF
First two dental centres opened in SAFTI and Beach Road Camp
First Air Force medical section opened at Seletar West Camp
Central Medical Stores (CMS) established
SMM moved to SAFTI
- 1969** First batch of SAF regular medical officers (MOs) operationalised
Helicopter search-and-rescue squadron operationalised
Naval Medical Inspection Room established
- 1970** SAF Public Health Vector Control Team established
First PDF Volunteer Medical Officer Course
- SAF's first overseas medical operation in East Pakistan
Naval Diving Medical Centre established in Sembawang Camp
Dr Koh Eng Kheng and Dr Cheng San Thau composed "The Medics of the Field"
- 1971** Central Medical Stores moved to Fort Canning
Dr Jimmy How appointed first SMO (Navy)
Dr Tan Kang Ping appointed first SMO (Air Force)
First two medics completed underwater medicine course
Inherited 14-man Mark III decompression chamber from British Royal Airforce
- 1972** Headquarters Medical Services (HQMS) established
First Underwater Medical Orderly Course
Acquisition of British One-Man Hyperbaric Chamber
Preventive Medicine branch established
- 1973** Sembawang Air Base Medical Centre established
Dr Roy Paul appointed first Chief Medical Officer (CMO)
Psychiatry section established at Tanglin Medical Centre
Acquisition of 10-man hyperbaric chamber
Brani Naval Base Medical Centre established
- 1974** First Medical Officer Cadet Course for full-time national servicemen
Significant expansion of Dental services
Central Medical Stores moved to Portsdown Road
First field hospital deployment under CO Dr Kwa Soon Bee
- 1975** Central Medical Stores participated in Operation Thunderstorm
Medical Classification Centre (MCC) at Tanglin Camp established under CO Dr Siah Kim Bin
First decompression chamber course conducted by Dr Benny Loo
- 1976** HADR mission to Bali
Central Medical Stores moved to Sembawang Wharf
LTC(Dr) Seet Lip Chai appointed CMO
- 1977** Second field hospital formed
- 1978** First aviation medicine familiarisation course for NS MOs
- 1979** First female Medical Officer Dr Luisa Lee commissioned
- 1981** Physical Performance Laboratory established in MCC
- 1982** LTC(Dr) Fong Yeng Hoi appointed CMO
Aeromedical Centre (ARMC) opened
- 1983** Pilot selection section established at ARMC
- 1984** Field hospitals reorganised into combat support hospitals (CSH)
Navy medical services contribution to MRT construction project
- 1984** COMEX chamber commissioned
Pilot Selection Section renamed Clinical Aviation Medicine Branch
Cardiopulmonary resuscitation unit established in SMM
First stress-shelter facility in the SAF
- 1986** Establishment of SAF Ward
LTC(Dr) Lim Meng Kin appointed as CMO
HQMS responds to Hotel New World disaster
Computer-aided instruction centre established at SMM
Trauma management course established at SMM
Acquisition of 20-man decompression chamber
Computerisation of Central Medical Stores records
Launch of MedLink newsletter
- 1987** Central Medical Stores reorganised into Medical Supply Depot (MSD)
COL(Dr) Lionel Lee appointed first SMO (Army)
LTC Ng Seng Chan appointed first SMSO
HQMS redesignated as Joint HQ
Joint Medical Committee (JMC) established
Dr Daniel Leong appointed first SMO (Healthcare)
Preventive, Psychological, Dental, MCC reorganised under SMO (Healthcare)
Development of naval forward deployed surgical capability
First aeromedical evacuation of critically ill patient
Fleet and NALCOM medical branches established
- 1988** SMM introduced problem-oriented casualty management
First batch of Advanced Medical Officer Course (AMOC)
- 1989** Physical Performance Laboratory renamed Soldier Performance Centre (SPC)
Naval Medical Research Centre (NMRC) established
- 1990** Operation Lionheart: Response to earthquake in the Philippines
MSD participated in Operation Flying Eagle
SMM moved to Ulu Pandan camp
- 1991** Operation Nightingale in Riyadh: SAF's first deployment to a conflict zone
Psychological Medicine Inpatient Centre opened in Changi Hospital
- 1992** Opening of SAF Medical Museum
First overseas dental humanitarian mission to Olongapo City
Advanced Trauma Life Support training introduced
Afloat Forward Supply Depot (AFSD) established
First tri-service medical exercise
MSD supports relief mission to Flores, Indonesia
- 1993** SAF Medical Corps receives regimental colours
Aeromedical support for United Nations Transitional Authority (UNTAC) Cambodia
- 1994** HQMS renamed Headquarters Medical Corps (HQMC)
CMO renamed Chief of Medical Corps (CMC)
Dr Lim Meng Kin becomes SAF Medical Corps' first General
- 1995** COL(Dr) Lionel Lee appointed CMC
Patient Care Enhancement System (PACES) commissioned
Office of Chief Army MO redesignated as HQ Army Medical Services
NMRC renamed Naval Medicine Hyperbaric Centre

- SMM trains Emergency Medical Technicians
Military Medicine Institute formed. SMO (Healthcare) renamed Commander Military Medicine Institute (MMI)
First formal appointment of SAF visiting consultants
1996 HQ Army Medical Services accorded title of SSSO HQ
MSD renamed Medical Supplies Warehouse under ST Logistics
Pioneer batch of paramedic instructors
SMM begins training Singapore Civil Defence Force paramedics
Pioneer batch of psychological trauma medicine course instructors
SAF Medical Corps receives State Colours
G-Flight environment trainer commissioned
1997 Operation Blue Cross: UN peacekeeping mission to Guatemala
Inauguration of Aviation MO brevet
Evacuation of Singaporeans from Cambodian crisis
Search and rescue mission for SilkAir flight MI185
1998 First SAF Military Medicine Conference
SAF Medical Corps attains ISO 9002 standard
Paramedic skills badge introduced
Handover of non-operational ARMC services to ST Medical Services
SMM paramedic training accredited by Justice Institute of British Columbia (JIBC)
SAF ward opened at Alexandra Hospital
First Navy MO to complete US DMO course: Dr Kang Wee Lee
Hosted 46th International Congress of Aviation and Space Medicine
Supported MRT construction project
1999 Operation Flying Eagle to Taiwan
First batch of Environmental Control Officers
Operation Blue Heron: East Timor Peacekeeping Mission
Formation of Submarine Medicine Branch
2000 Full operationalisation of Navy SUBSAFE capability
Deployment clinic established
Hosted 10th Asia Pacific Military Medicine Conference
Operation Flying Eagle: HADR mission to Bengkulu, Indonesia
Introduction of Independent Duty Corpsmen to the Navy
Support for SQ006 plane crash disaster
2001 COL(Dr) Wong Yue Sie appointed CMC
Acquisition of first Naval Mobile Surgical Containers
1st Indo-Sin Bhakti Sosial
Environmental assessment in all overseas SAF camps
Weight management programme introduced
2002 Management of SARS outbreak
HQMC moved to Nee Soon Camp
Acquired Air Mobile Life Support Units
1 Medical Squadron (1MS) established under CO Dr Gerard Nah
- SMM moved to Nee Soon Camp
2003 Official opening of SAF Medical Corps complex
Preventive Medicine branch released policies for SARS management
SMM AED training accredited by National Resuscitation Council
2004 Operation Flying Eagle: SAF's largest HADR response to Sumatran Earthquake
Office of Chief Air Force MO redesignated as HQ Air Force Medical Services
First Naval Medicine Seminar and Medical Rescue exercise
Base Medical Squadron (BMS) established under CO MAJ(Dr) Tang Kong Choong
2005 Medical support for Bali bombings
Medical support for earthquake in Nias
Shipboard Medical Teams deployed to Arabian Gulf
Aviation medical officer training programme formalised
2006 Official inauguration the logo of RSAF Medical Service and Aeromedical Centre
COL(Dr) John Wong appointed CMC
Medical support for flash floods in Northern Thailand
Medical support for Yogyakarta earthquake
Navy Medical Service inaugurated
SMM reorganised as SAF Medical Training Institute (SMTI). Dr Robin Low appointed Commander SMTI
2007 Medical Skills Training & Simulation Centre (MSTSC) opened
SAF Dental Team deployed to Afghanistan
2008 SAF Medical Corps hosted the 18th Asia Pacific Military Medicine Conference
First Oral Maxillofacial Trauma and Forensic Dentistry Symposium
MV Swift Rescue commissioned
MOU signed with SGH Hyperbaric Diving Medicine Centre
Chief Naval Medical Officer appointed concurrently as Commander Force Medical Protection Command
Operationalisation of negative pressure individual isolation system
1MS declared fully operational
Operation Blue Ridge: Reconstruction efforts in Afghanistan
2008 - Operation Blue Sapphire: Shipboard medical support
2015 for anti-piracy efforts in Gulf of Aden
2009 COL(Dr) Benjamin Seet appointed CMC
New aviation physiology training equipment commissioned
2011 COL(Dr) Kang Wee Lee appointed CMC
Co-Chair ADMM - Plus Experts' Working Group in Military Medicine (EWG-MM) (from 2011-2013)
ES Med Log successfully rolled out – Common supply chain planning and executive platform for Medical Logistics
MOU signed with CGH and SGH to advance Military Sports Medicine
- Operationalisation of RSS *SUPREME* as first frigate surgical platform during Ex CARAT 11
Commencement of Advanced Diploma in Paramedicine (collaboration with JIBC and NYP)
2012 Commencement of Diploma in Paramedicine (collaboration with JIBC and NYP)
FOC of Medical Decontamination and Treatment Vehicle (MDTV)
SAF Cardiac Fitness Centre set up
Launch of Centre for Infectious Disease Epidemiology and Research (CIDER)
SMTI Medical Simulation Training Centre (MSTC) officially opened by DM
2013 Implementation of Physician Partnership Programme
2014 Ops Swift Angler (SAL for MH370)
Ops Swift Angler (SAL for QZ8501)
Navy and Airforce Medical Centres transferred to Navy Medical Service and Air Power Generation Command
MOH accreditation of Aviation Medicine specialty
Emergency Medical Technician Course attained WDA and WSQ certification
SAF MOs deployed in ED of CGH and KTPH
Implementation of Aircrew Systematic Strength and Endurance Programme (ASSET)
2015 Largest medical support for national level event - SG50 National Day Parade
Implementation of Aviation Physiology Training (APT)
E-learning courseware rolled out
Implementation of 3G Combat Ambulance
SAF Emergency Ambulance Service (EAS) operationalised
Ops Swift Lion (Nepal)
COL(Dr) Tang Kong Choong appointed CMC
Official Opening of SAF Cardiac Fitness Centre
MOU signed on National Paramedic Training and Education Roadmap
Operationalisation of RSN Rapidly Deployable Maritime Container
2016 Launch of PACES 3
Opening of SAF Ward
RSN RDMC won MINDEF PRIDE Day 16 Best Innovation Project Award
2017 HQMC co-hosted Asia Pacific Military Health Exchange 17 with USN PACOM
SPC joined with the Army Fitness Centre (AFC) to form the new Centre of Excellence in Soldier Performance
PACES 3 won "Digitised Care to Support One Healthcare System" category at National Health IT Excellence Awards.
Deployed medical team for peace support operation in Iraq
MED50 celebration – HQMC Family Day, Dining In, Commemorative Book, Time Capsule, Mural

OUR ORIGINS (BEFORE 1968)

At the beginning, volunteers answered the call

The provision of military medical services in Singapore began in 1901 with the formation of the Ambulance and Bearer Section of the Singapore Volunteer Artillery (SVA), commanded by MAJ P.C. Mugliston. In 1913, the SVA became the Singapore Volunteer Corps (SVC) and the Ambulance and Bearer Section was enlarged to become the Bearer Company of the SVC.




An Ambulance Hippomobile in 1905: Early means of transporting patients

Two years later, the Bearer Company had its first taste of action, providing medical assistance during the mutiny of the Fifth Indian Light Infantry at Alexandra Barracks. Subsequently it was also mobilised in WWI (1914-1918). The Bearer Company was reorganised as the Singapore Volunteer Field Ambulance Company in 1922, which by then was under the centralised command of the Straits Settlement Volunteer Force.

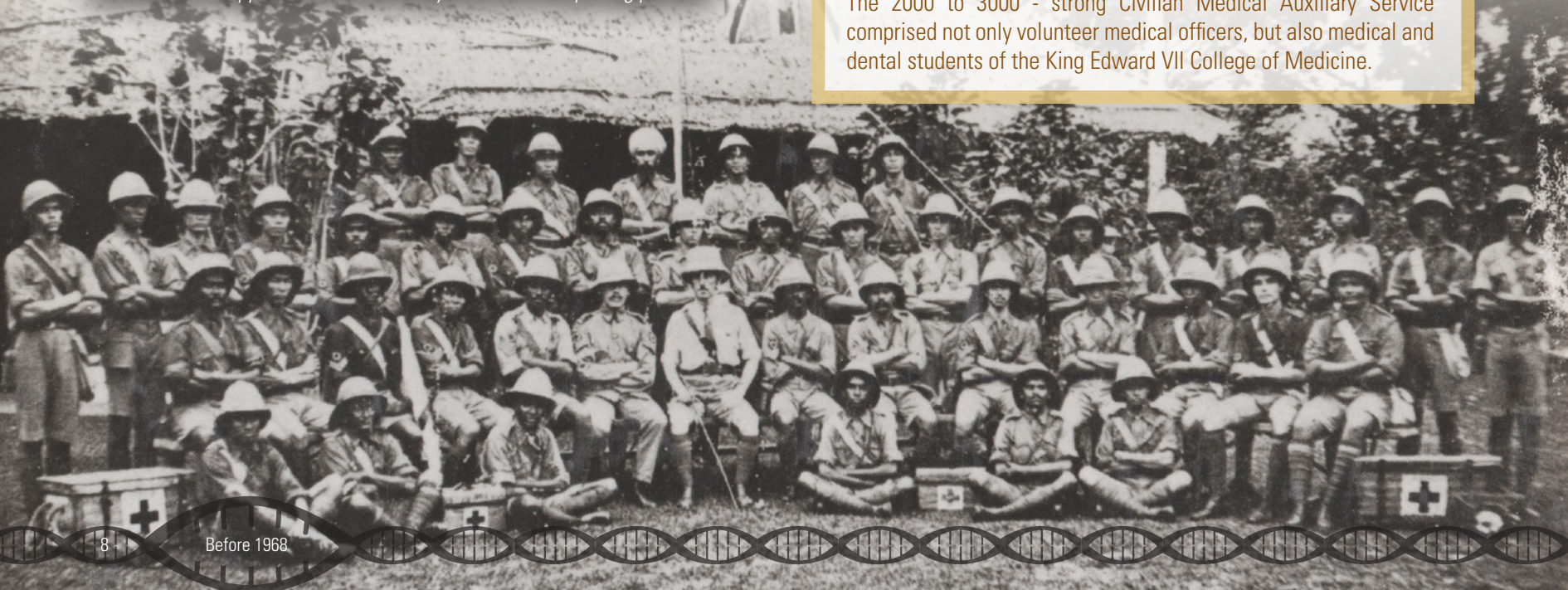
In 1934, the Straits Settlement Naval Volunteer Reserve (SSNVR) was formed. The Naval Medical Services, which comprised volunteer medical and dental officers, was established soon after.

On 18 Jan 1935, the British Admiralty presented the Singapore Government with the HMS *Laburnum* as the Reserve's headquarter and drill ship. It was berthed at Telok Ayer Basin and had a sick bay on board. By 1941, the dental section of the SSNVR was formed, sited next to the sick bay.

In preparation for the looming war, the Singapore Volunteer Field Ambulance Company was incorporated into the Civilian Medical Auxiliary Service. On 8 Dec 1941, Japanese bombers attacked Singapore and the Medical Auxiliary Service was called into action to provide aid to victims.



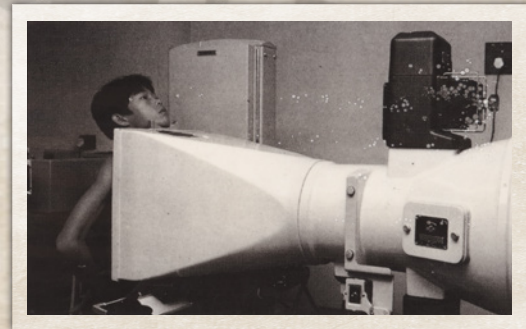
The 2000 to 3000 - strong Civilian Medical Auxiliary Service comprised not only volunteer medical officers, but also medical and dental students of the King Edward VII College of Medicine.





In 1957, Dr S. Ganendran was appointed as the first Commanding Officer of the Singapore Army Medical Corps, still a group of volunteer medical officers. Dr Ganendran was succeeded by Dr George Chew, then Dr S. Ayarduray.

The Medical Orderlies Training School was started in May 1966 to provide training for medics supporting the frontline units. During the same year, medical screening for all national service registrants began.



The medical screening process ensured that all enlistees are properly classified and fit for national service

BIRTH OF THE SAF MEDICAL SERVICES

In 1967, the Senior Medical Officer (SMO) Department was established, headed by Dr Jimmy Choo, a surgeon seconded from the Ministry of Health. This marked the first formal medical structure in the SAF and the birth of the SAF Medical Services. The SMO reported to the General Staff Division in the headquarters of the Ministry of Interior and Defence (MID).

BIRTH OF MODERN-DAY OPERATIONAL MEDICAL SUPPORT (1968 - 1977)

ESTABLISHMENT OF NAVAL MEDICAL SUPPORT

In 1967, the first Naval Medical Centre was established in Pulau Blakang Mati (Sentosa). COL (Dr) Jimmy How was appointed as first Senior Medical Officer (Navy) in Nov 1971. This set the stage for the development of the field of Diving and Hyperbaric Medicine.



COL(Ret)(Dr) Jimmy How with fishermen divers



The first SAF Diving Centre at Naval Diving Unit (NDU), Terror Camp, 1969



Brani Medical Centre Medical Team

ESTABLISHMENT OF AEROMEDICAL SUPPORT

In June 1968, the Air Force Medical Services was established at Seletar West Camp. The medical centre consisted of only 3 rooms and was headed by CPT (Dr) Robert Yeo. He was assisted by 3 medical orderlies. CPT(Dr) Yeo was the first MO in Singapore to train at the Royal Air Force Institute of Aviation Medicine in the UK. MAJ(Dr) Tan Kang Ping was appointed as SMO (RSAF) in Nov 1971, which accelerated the development of Aviation Medicine.

In Oct 1969, Search and Rescue (SAR) capability was developed. The squadron of Alouette III helicopters was part of the Royal Air Force. After the withdrawal of British forces in 1971, the squadron became part of the Singapore Air Defence Command. The Alouette Squadron was later renamed 120 Squadron, and finally expanded to become 1 Medical Squadron (1MS) in Jun 2002.



The Alouette Squadron in 1970




Hoisting a stretchered casualty was exhilarating!

"We had to learn quick from those who knew the game. We were trained to train others in our establishment. We were sent overseas to be trained, observe and do hands-on so as to return and develop our own setups."

– COL(Ret)(Dr) Jimmy How

DEVELOPMENT OF FORWARD DEPLOYED FIELD SURGICAL CAPABILITY

The first Field Hospital was deployed in July 1974 after years of planning by the pioneer group of volunteers. It provided resuscitative surgery to stabilise casualties for rearward evacuation. It was the forerunner of the Combat Support Hospital, which came into being ten years later in 1984. Each Field Hospital consisted of 3 Surgical Companies, each one possessing its own X-ray and laboratory sections. The first deployment of 'A' Coy was conducted in Colombo Camp under the command of Dr Kwa Soon Bee as the Commanding Officer, and Dr Richard Yung as Officer-in-Command of Alpha Company. In Nov 1974, Dr Earl Lu successfully performed an appendectomy in its OT trailer deployed on an open muddy field.



SAF's First Foray into Humanitarian and Disaster Relief

Soon after its formation, the SAF deployed its first ever medical team for an overseas humanitarian and disaster relief mission to provide medical aid to victims of Cyclone Bhola in East Pakistan in 1970.



MEDICAL TRAINING IN THE SAF

In 1967 LTA Moorthy, the Officer-in-Charge of the Medical Orderlies Training School at Beach Road Camp, was transferred to the SAF Training Institute (SAFTI) to lay the groundwork for the School of Military Medicine (SMM).

SMM was ready to function in Feb 1968 with CPT (Dr) Roy Paul as its first Commanding Officer. It was housed initially in SAFTI and a small lab was made available for lessons on Anatomy and Physiology. It trained the first batch of Combat Medical Orderly Instructors.



Opening Ceremony of SMM on 22 Apr 1968

From April to November 1970, the first batch of volunteer medical officers comprising surgeons, physicians and anaesthetists underwent a part-time People's Defence Force (PDF) Medical Officer Cadet Course

held in Beach Road Camp. The 14 volunteers were: Dr Kwa Soon Bee, Dr Richard Yung, Dr Cheong San Thau, Dr Chew Chin Hin, Dr Richard Chin, Dr Jerry Lim, Dr Arthur Lim, Dr Lo Hong Ling, Dr Lee Soo Chew, Dr Chan Swan Tong, Dr William Chew, Dr Moses Yu, Dr Wong Yuen Poh and Dr Lim Kwang Hui. Course Commander was CPT(Dr) Cheong Yuen Hing, Hd Dental Branch, HQ Medical Services.



From Apr – Oct 1973, the first Medical Ancillary Officers' Course with female trainees was conducted

WHEN DOCTORS HEAR THE DRUM BEATS AT PARADE

IT WAS strictly NO stethoscopes for 13 doctors at the Beach Road Camp of the 1st Singapore Infantry Regiment yesterday evening. Those things of course, would be quite out of place. For the affair called only for keeping time to martial tones of a military band, and marching by like spick-and-span officer cadets should. The men were all members of the Singapore Medical Association who volunteered as military medics. They were commissioned as Second Lieutenants by Mr. Pang Tee Pow, the Permanent Secretary to the Defence Ministry.

ESTABLISHMENT OF HEADQUARTERS MEDICAL SERVICES (HQMS) IN 1972

HQMS consisted of Manpower, General Staff, Medical Logistics and Medical Specialist Branches. MAJ (Dr) Roy Paul was the first Chief Medical Officer. They were pre-occupied with setting up medical centres and addressing the shortage of trained manpower.



First site of SMM at SAFTI (1968), which later became School of Infantry Weapons (SIW) SAFTI



Second site of SMM at SAFTI (1970), which later became SAF Infantry NCO School (SAFTINCOS)



Third site of SMM at SAFTI (1972) which later became Tango Wing of OCS. It remained there till its move to Ulu Pandan Camp in 1990.

INTRODUCTION OF SPECIALTY SERVICES

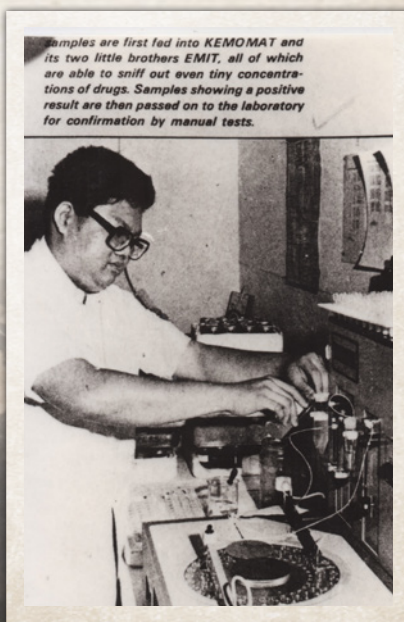
DENTAL SERVICES

In April 1968, dental services were introduced to the SAF with the recruitment of its first Dental Officer, CPT(Dr) Benny Chan. It also marked the opening of the first two dental centres at SAFTI MI and Beach Road Camp. In April 1973, National Service for dental surgeons began and provided opportunities for the growth and expansion of dental services in the SAF.



PREVENTIVE MEDICINE

In 1970, the SAF Public Health Vector Control Team was established. In 1972, the Preventive Medicine Branch was officially set up as part of HQMS. It tackled the rising problem of drug abuse in the mid-seventies and used a two pronged approach of reform and education.



Laboratory technician testing drug samples

Fogging of camps started in the 1970's

MILITARY PSYCHIATRY SERVICES

The humble beginnings of Military Psychiatry in the SAF can be traced to a refurbished storeroom at Tanglin Medical Centre, where the Psychiatric Branch was housed in July 1973. The psychiatric needs of servicemen were attended to by a single psychiatrist, Dr Fong Yeng Hoi and a pair of overworked medical orderlies. As demand for in-house psychiatric treatment continued to increase, it became clear that a single psychiatrist was not enough, and the Psychiatric Section was upgraded into a Psychiatric Branch in the early 1980s. In 1984, the SAF Care Centre was set up at Nee Soon Camp as the first facility in the SAF for soldiers with stress-related disorders and it was then upgraded in 1991 to the Psychological Medicine Inpatient Centre (PMIC), an intermediate psychiatric ward capable of inpatient management of common psychiatric disorders.

"There was also the problem I think at that time of the drug addicts increasing in numbers... there were also peculiar groups of people like homosexuals, temple mediums who saw that if there was not consistent policy within the SAF for dealing with them, then they will try to squeeze as much privilege and excuses from duties..."

– LTC(Ret)(Dr) Fong Yeng Hoi



Inpatient psychiatric ward in the SAF

EXPANDING SPECTRUM OF OPERATIONAL MEDICAL SUPPORT AND TRAINING FOR THE SAF

(1978 - 2007)

GROWTH OF AVIATION MEDICINE

The RSAF Aeromedical Centre (ARMC) was inaugurated in 1982 to provide aeromedical clinical services, conduct aeromedical training for aircrew and to undertake research into problems affecting aircrew safety and performance. It was initially sited at the old departure hall of Paya Lebar Airport and was fully equipped with eye, ENT, X-rays and laboratory facilities. ARMC took over pre-enlistment screening of all RSAF air vocationalists in 1983.

In 1985, the new ARMC at Airport Road was completed to house the newly acquired medical equipment. In 1986, ARMC took possession of the Night Vision trainer, Ejection Seat trainer as well as a new 21-man decompression chamber. In 1987, the Aeromedical Centre at 492 Airport Road was commissioned. In the same year, the aeromedical evacuation team successfully evacuated a semi-conscious stroke patient from Brunei and provided in-flight intensive care monitoring en route to Singapore. The G-Flight Environment Trainer (G-FET) a human centrifuge trainer was included in the ARMC armamentarium in 1994.



In a move to strengthen SAF's aeromedical evacuation capabilities, 1 Medical Squadron (1MS) was formed in 2002, with MAJ (Dr) Gerard Nah as its first Commanding Officer. The first Air Mobile Life Support Units (AMLSUs) were operationalised in the same year, forming a significant part of the Medical Squadron's and the Aeromedical Centre's capabilities.

The growth of Aviation Medicine in Singapore and in the SAF also gained international recognition – the RSAF, CAAS and ST Medical Services jointly organised the 46th International Congress of Aviation and Space Medicine in 1998. In 2004, the Office of the Chief Air Force Medical Officer (CAMO) was transformed into the RSAF Medical Service, reflecting the maturity of the service and greater efforts for operational integration into the RSAF's warfighting capabilities.

GROWTH OF NAVAL MEDICINE

From 1984 to 1987, the Naval Diving Unit Medical Centre was heavily involved in the Mass Rapid Transit (MRT) development project, ensuring that industrial health & safety guidelines were being adhered to, and treating 164 cases of decompression sickness. Initially treating patients only in the Mark III decompression chambers inherited from the British, the French COMEX chambers were later commissioned to provide ICU-level services to patients.

A new 20-man Japanese decompression chamber was also installed in 1986. From 1998 to 1999, Navy Medical Service (NMS) provided support for the construction of the North-East MRT line.



Supporting the MRT compressed air works (1984 to 1987).



From 1994 to 2004, the Navy was building up new platforms and capabilities like the minehunters, landing ship tanks, submarines and frigates. This required NMS to develop organic shipboard medical facilities as well as afloat surgical support to care for these forces at sea.

At the turn of the millennium, submarine medical support was conceptualised to support the new submarine squadron. The Navy's Submarine Escape and Rescue facility with a Recompression Chamber Complex was commissioned in 2000. Exercise Pacific Reach 2000 marked the full operationalisation of the RSN's SUBSAFE capabilities with the return of Singapore's first Challenger-class submarine.



Over the three-year period between 1984 and 1987, nearly 3,000 workers were screened for fitness to work in compressed air environment. About 190,000 decompressions were carried out during the entire project and RSN treated about 170 cases of decompression illness.



Commissioning of LST-based Submarine Hyperbaric Chamber Vessel on RSS PERSEVERANCE.

"There was identified a requirement to put greater emphasis onto the development of Underwater Medicine, as well as Occupational Medicine and enhancing performance of our servicemen."

– SLTC(NS)(Dr) Gregory Chan

In 2001, two RSN Independent Duty Corpsmen (IDC) completed the USN Submarine IDC Course, marking the beginning of the era of specialised medical support on board submarines and surface ships.

In recognition of NMS's commitment to hyperbaric medicine, the Ministry of Manpower has since accredited the training undertaken by RSN doctors with the certification of Designated Workplace Doctor for Compressed Air Works [DWD(CAW)].

The Navy's Independent Duty Corpsmen undergo a rigorous one year academic programme with the United States Navy to enable them to provide medical care independent of doctors. What first started as medical support for submarines has now expanded to providing support on board surface ships. To enable them to perform this function out at sea, the Singapore Medical Council provisioned for IDCs to prescribe medication during independent cover.

THIRD SCHEDULE		
EXEMPTION FOR CERTAIN PERSONS FROM SECTION 29(2)(b) OF THE ACT		
First column Person exempted	Second column Prescription only medicine to which the exemption applies	Third column Conditions
1. Independent Duty Corpsmen ("IDC") deployed on Republic of Singapore Navy ("RSN") vessels who have been authorised by the Chief Navy Medical Officer to administer prescription only medicines.	All prescription only medicines listed in the IDC Medications List approved by the Chief Navy Medical Officer.	An IDC— (a) shall not administer the prescription only medicines to any person other than personnel on board RSN vessels when the vessels are out at sea, or on military operations and exercises; (b) shall carry out the administration of the prescription only medicines in accordance with IDC clinical protocols approved by the Chief Navy Medical Officer; and (c) shall keep proper records of his administration of the prescription only medicines.

[S 204(2008) wq/01/05/2008]

ENHANCING MILITARY MEDICAL TRAINING STANDARDS

The ability to administer early basic resuscitative procedures is key to enhancing casualty survival. In 1984, the nationally accredited Cardio-Pulmonary Resuscitation (CPR) Unit was formed at the School of Military Medicine (SMM). Subsequently, satellite CPR centres were set up around Singapore, including Pulau Tekong, to meet the growing demands of CPR training in the various camps and bases.

In 1986, the Trauma Management Course in SMM was inaugurated to enhance trauma care in the SAF. In the same year, Computer-Aided Instruction (CAI) was introduced to enhance military medical education. (Background picture: CAI in the early days)

The SAF Medical Corps collaborated with the Chapter of Surgeons at the Academy of Medicine to introduce Advanced Trauma Life Support (ATLS) course, which is accredited by the American College of Surgeons, to Singapore. The inaugural ATLS course held at Ulu Pandan Camp for our doctors was the first in Asia.



The SAF Medical Corps has played a pivotal role in the training of paramedics for both the military and civilian sectors since the inception of the SAF-SCDF Paramedic Training Programme in 1996. Two years later, SMM obtained accreditation as a paramedic training institution from the Justice Institute of British Columbia. Leveraging on technology to enhance training realism, the Medical Skills Training & Simulation Centre (MSTSC) was established in 2007. In 2012, the MSTSC concept was further refined with wireless computer controlled mannequins together with a new variety of realistic environments and the Medical Simulation Training Centre (MSTC) was officially opened by Dr Ng Eng Hen, the Defence Minister.

Proposal for the Paramedic Badge



1. Star of life represents the emblems of the International Emergency Medical Service.
2. The three colours represent the tri-service colours of the SAF.
3. The Medical Logo represents the SAF Medical Corps Logo.

The Emblems with red outline are to be worn by qualified locally trained, Level 3 Paramedics on the left chest for the SAF No. 4 and No. 3 uniform respectively.

Louisa in the lead



Louisa (right) leads the march-past. — Picture by HARBIS.

By IRENE HGOO

SIX months of rigorous military training has transformed Dr Louisa Lee, 31, into a 'war woman'.

The 2006 Best Officer Award (BOA) winner, Louisa, has also been recognised as the most outstanding female in the SAF Medical Corps.

The award was presented to her by the Chief of the General Staff, Major General Winston Chan, who reviewed the parade.

The Merit Award was also presented to her by the Chief of the General Staff, Major General Winston Chan, who reviewed the parade.

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Louisa - Japs

The first female MO, Dr Luisa Lee, commissioned in 1979, paving the way for capable colleagues of the fairer sex to serve the SAF as doctors.

BEST OFFICER CADET

This award is presented to the most outstanding Officer Cadet (male or female) in the Course. The winner is considered best in overall grading, based on his/her traits, leadership qualities and practical fieldwork/ability.

EVOLUTION OF THE SAF MEDICAL CORPS AS A JOINT HEADQUARTERS

The HQ Medical Services (HQMS) was accorded Joint HQ status in 1987 to emphasise its tri-service scope of operations, with the positions of Senior Medical Staff Officer (SMSO) and SMO (Army) formed to coordinate the HQMS staff functions and the Army's medical matters respectively. Together with the SAF Chief Medical Officer (CMO), SMO (Healthcare), SMO (Navy), and SMO (AirForce), they formed the Joint Medical Committee (JMC) to facilitate effective tri-service coordination.

"The role of SMSO has evolved from primarily coordinating the principal staff branches of HQMC in the 1990's to playing the role of a Chief of Staff to CMC today, spearheading Capability Development, Force Generation planning, Medical Logistics provision as well as coordinating and executing real-time operations and medical coverage for large scale national level events such as National Day Parade." – COL Ng Hock Sing, SMSO (2012 – Present)



In 1992, the first tri-service medical exercise in the SAF's history was conducted, involving 750 reservists and integrating SAF and MOH medical support systems.

In 1996, HQ Army Medical Services (HQ AMS) was inaugurated. The State Colours was also awarded to the SAF Medical Corps in the same year.

In 2002, the SAF Medical Corps bid goodbye to their old premises at Tanglin, and moved over to the new SAF Medical Corps complex in Nee Soon Camp.



Sunset Ceremony at Dempsey Road



Our new home



STRENGTHENING FORCE HEALTH

New move to ease doctor shortage in armed forces

NATIONAL servicemen who have been accepted by the National University of Singapore for medical or dentistry courses may now be released from service for studies after only six months instead of the usual 18 months.

This is because the Singapore Armed Forces is short of doctors and dentists.

The servicemen will get their degrees before re-joining the SAF to complete the remaining two years of their national service as medical and dental officers.

But the number of servicemen released early each year will depend on how many the university can accept and how many the Defence Ministry can release.

Previously, those accepted by the university had to put in 18 months'

To meet the healthcare needs of a growing SAF, full time National Servicemen (NSFs) were allowed to disrupt from National Service after 6 months to attend medical school, and to return to serve as Medical Officers thereafter. This was supported by the Cabinet in 1981 and a sizable force of NSF doctors was formed.

The office of SMO (Healthcare) was established in 1987 to improve primary and secondary healthcare for soldiers, to reduce absenteeism and to have a fighting force maintained in peak physical performance with lower health costs. The office liaised with MOH and hospitals, and oversaw the Preventive Medicine Branch, the Psychological Medicine Branch, the Dental Branch, the Medical Classification Centre, and the SAF hospital wards.

In 1995, the Patient Care Enhancement System (PACES) was commissioned to integrate all SAF servicemen's medical records into one database.



SAF goes on-line with soldiers' medical records

Faster, up-to-date care for servicemen

With the introduction of the Patient Care Enhancement System (PACES), the Singapore Armed Forces (SAF) has taken a major step towards providing faster, up-to-date care for its servicemen. The system, which is currently in its third version, integrates the SAF's medical records with those of the national healthcare system.



PACES was truly an innovative and groundbreaking development as Singapore's first comprehensive electronic medical record system. It is currently in its 3rd version which further integrates the

SAF medical records with those of the national healthcare system.

"The SAF contributed to the national effort to combat SARS through the deployment of new technology such as thermal scanners, and manpower to assist in preventing disease spread. Since then, the SAF has provided technical expertise and support during various national disease outbreaks, including the 2009 H1N1 influenza pandemic. SAF has also participated in engagements with international organisations on topics such as global health security and disease preparedness."

– SLTC(A/Prof) Vernon Lee

SAF HEALTHCARE

MILITARY MEDICINE INSTITUTE

OUR VISION
TO BE A FIRST CLASS HEALTH SERVICE

OUR MISSION
TO CARE FOR THE HEALTH OF THE SAF.
WE WILL DELIVER THE HIGHEST QUALITY PATIENT-CENTRIC CARE
TO SUSTAIN AND ENHANCE FORCE HEALTH IN PEACETIME AND WAR.



The Military Medicine Institute (MMI) was formed in 1997, with a one-stop specialist outpatient centre sited in Kent Ridge where SAF servicemen can access specialist healthcare services. A deployment clinic was established in 2000 to provide preventive medical services such as vaccination and chemoprophylaxis for servicemen posted overseas.



Force medical protection was enhanced with the formation of the Medical Response Force in 2002. Its role was to provide medical support to SAF troops during chemical, biological and radiological (CBR) incidents. In addition, significant public health efforts were undertaken with the SARS epidemic response (2003) and the elimination of malaria on Pulau Tekong (2007).

LENDING A HAND TO HADR AND PEACE SUPPORT MISSIONS

DISASTER RELIEF MISSIONS

The SAF Medical Corps has been deploying medical support teams for HADR missions since the 1970s. Notably, CMO LTC(Dr) Lim Meng Kin commanded the rescue operation during the collapse of Hotel New World in 1987, with SAF soldiers rummaging through the rubble, SAF ambulances sending patients to SGH, and SAF helicopters on standby for urgent evacuation.

The SAF Medical Corps has also responded to many disaster incidents overseas, including earthquakes in Baguio (1990, 5500 patients treated), Taiwan (1999, 900 patients treated), Bengkulu (2000, 945 patients treated), Aceh (2004), Nias (2005, 1188 patients treated), and Yogyakarta (2006). OPERATION FLYING EAGLE to Aceh (2004) marked the first time the SAF Medical Corps deployed level 2 medical capabilities, and is the largest medical relief mission to date, with 114 medical personnel from the SAF, SCDF, DSO, and MOH being called upon.

PEACE SUPPORT OPERATIONS

OPERATION NIGHTINGALE marked the first instance where the SAF Medical Corps was deployed for a peace support mission, with a 30-man team being flown to Saudi Arabia in 1991. Other peace support operations in the 1990s included aeromedical support for UNTAC in Cambodia (1993), and medical support and long range patrol work for Operation BLUE CROSS in Guatemala (1997).

As part of a larger UN effort to stabilise the East Timor region, the Corps took part in Operation BLUE HERON (1999-2003), for which a total of 14 medical teams were deployed. Similarly, to aid in the reconstruction efforts in Iraq, the Corps deployed shipboard medical teams to the Northern Arabian Gulf for Operation BLUE ORCHID (2003-2008).

Before the launch of the SAF's reconstructive efforts in Afghanistan (OPERATION BLUE RIDGE), then LTC(Dr) Chua Wei Chong was deployed as part of the Needs Assessment and Survey Team (NAST) for the dental mission of Bamiyan while then LTC (Dr) Tang Kong Choong was deployed as part of the NAST for the surgical mission of Tarin Kowt. The SAF Medical Corps subsequently deployed medical, surgical and dental teams to support coalition efforts in Afghanistan from 2007-2013.

SHIFTING GEARS TO SUPPORT THE NEEDS OF AN EVOLVING OPERATIONAL ENVIRONMENT

(2008 - 2017)

MATURATION OF NICHE MILITARY MEDICINE EXPERTISE

The hard work and perseverance of our people to develop our niche expertise have culminated in recognition nationally and internationally.

UNDERWATER MEDICINE

NMS sealed its position as the preeminent Underwater Medicine Subject Matter Expert in Singapore and the region through the establishment of the SGH Hyperbaric and Diving Medicine Centre (HDMC) to provide a one-stop diving and hyperbaric medicine facility with access to tertiary specialist services in 2008 as well as operationalisation of MV SWR, a dedicated submarine rescue capability in 2009. To further enhance frontline maritime medical support, RSS *SUPREME* was operationalisation of the first frigate surgical platform during Ex CARAT 11.

OROMAXILLOFACIAL TRAUMA AND FORENSIC DENTISTRY

With a significant proportion of casualties with oral maxillofacial trauma in the recent wars, the ability to manage such casualties has increased in importance. To familiarise the SAF Dental Officers on the principles of managing oro-facial trauma and forensic dental identification, the first edition of the SAF's in-house training course (Oral Maxillofacial Trauma and Forensic Dentistry Symposium) was conducted in 2008.



RSN-SGH joint collaboration in Diving and Hyperbaric Medicine

Operationalisation of the Navy's dedicated SUBSAFE capability



AVIATION MEDICINE

In 2014, Aviation medicine was recognised by the Ministry of Health as a medical sub-specialty, raising its professional status to be on par with other mainstream specialties. 1 Medical Squadron was also fully operationalised in 2008 and has been activated for close to 200 SAR missions since.

MILITARY SPORTS MEDICINE

To address the high proportion of sport-related injuries, a Memorandum of Understanding was signed with Changi General hospital and Singapore General Hospital to advance Military Sports Medicine. Starting from 2011, all SAF Medical Officers were trained in Sports Medicine. On 8 May 2017, the Soldier Performance Centre joined with the Army Fitness Centre to form the new Centre of Excellence in Soldier Performance (CESP).

DEVELOPMENT OF NEW CAPABILITIES

The emphasis on force health protection took a further step forward with the establishment of the Force Medical Protection Command in 2008 to provide medical protection against chemical, biological, radiological and occupational health hazards, with the aim of enhancing the SAF's operational readiness. It brought together the Preventive Medicine and CBRD (Chemical, Biological and Radiological Defence) Branches from Headquarters Medical Corps (HQMC) and the Medical Response Force (MRF) from the SAF Medical Training Institute (SMTI). The SAF's early early biosurveillance system has also been enhanced through collaboration with the Centre for Infectious Disease and Epidemiological Research (CIDER) since 2011. In 2012, the Medical Response Force operationalised the Medical Decontamination and Treatment Vehicle (MDTV) to enhance frontline medical support against chemical, biological, radiological and nuclear threats.

The introduction of the Navy's Rapidly Deployable Maritime Container (RDMC) and Army's BELREX medical variant in 2016 enhanced forward deployed medical support through the incorporation of advanced technology as well as industry-standard medical features.

The operationalisation of the Naval Helicopter (NH) MEDEVAC capability highlights how far the SAF Medical Corps has come in strengthening inter-service integration in capability development!



A fully deployed MDTV



The 3G BCS tonner was operationalised in 2009 and has decreased deployment time and manpower effort.



The RDMC was deployed on board the Landing Ship Tank RSS PERSISTENCE to provide surgical aid to the population of Tomini, Indonesia



Medical Variant of the BELREX armoured vehicle



ENHANCEMENTS TO PARAMEDIC TRAINING

Collaborations with the Justice Institute of British Columbia (JIBC) and Nanyang Polytechnic resulted in the establishment of Diploma and Advanced Diploma courses in Paramedicine in 2012. A National Paramedic Training and Education Roadmap was subsequently developed in 2015 and a 6-party Memorandum of Understanding was signed to cement the collaboration between employers of paramedics and education institutions to encourage skills mastery in the field. Of note, the Emergency Medical Technician Course attained the Workforce Development Agency (WDA) Workforce Skills Qualification (WSQ) certifications.



Medical training was augmented by the Medical Simulation Training Centre, which serves to provide a training platform under realistic field conditions for medical officers and medics alike. Experienced civilian Physician Partners were introduced to medical centres to enhance provision of frontline primary healthcare as well as to mentor junior medical officers.

SUPPORTING FRONTLINE HEALTHCARE

As the spectrum of operations grew, so did the logistics tail. The management of medical logistics was enhanced through the implementation of the ES Med Log system in 2011, a common supply chain planning and executive platform for medical logistics. The Medical Corps continued to leverage technology to streamline and integrate workflow processes. In 2016, PACES 3 was launched. For the first time, SAF servicemen records were seamlessly integrated with those of the larger national healthcare system and interfaces real-time with different systems to provide more holistic medical care. PACES 3 also encourages servicemen to manage their personal health by permitting access to their health records and military medical information.

CONTRIBUTING TO THE INTERNATIONAL FIGHT AGAINST TERROR AND PIRACY

In 2008, the SAF deployed its first medical and surgical team to join in coalition reconstruction efforts in Afghanistan. In the same year, Navy Medical Service also started deploying organic Shipboard Medical Teams on board Navy frigates and Landing Ship Tanks to support anti-piracy patrols in the Gulf of Aden. These deployments were multi-year commitments (the deployments to Afghanistan and Gulf of Aden ended in 2013 and 2015 respectively) and reinforced the Medical Corps' dedication to enhancing multilateral cooperation. In 2017, a primary healthcare team was deployed to Iraq in support of the multinational coalition to defeat the Islamic State in Iraq and Syria.

CEMENTING SAF MEDICAL CORPS AS A LEADER IN MILITARY MEDICINE

The regional and international military medicine community remains a key avenue for goodwill and professional exchange to elevate standards of military medicine. HQ Medical Corps co-chaired the ASEAN Defence Ministers' Meeting (ADMM) – Plus Experts' Working Group in Military Medicine (EWG-MM) from 2011 – 2013. The ADMM-Plus exercises and deployments have strengthened multilateral ties and engendered confidence in partner nations' abilities to mount HADR and peace support operations. The Medical Corps was also called upon to support contingency operations such as the Search and Locate missions for MH370 and QZ8501, humanitarian and disaster relief during the New Zealand earthquake in 2011 and Nepal earthquake in 2015 as well as haze relief efforts in the region.

The Medical Corps co-hosted the Asia-Pacific Military Health Exchange 17 with the United States Pacific Command. The international conference, themed "Future Challenges and Collaborations in Military Health", focused on global

health security, military in global health engagement, emerging infectious diseases, advances in field casualty management and the future of military medicine training. The four-day conference featured over 250 oral and poster presentations, covering topics ranging from operational medicine research and advances, military nursing and allied health issues, medical training, to medical

technology and informatics. The conference also involved over 500 delegates comprising senior military officers, active service and reserve medics, nurses, allied health professionals and defence researchers from the Asia-Pacific countries.



“... military medicine communities often act as a bridge to build relations and trust among militaries...” Dr Ng Eng Hen, Defence Minister, at his opening address during APMHE17

As the SAF Medical Corps celebrates five decades of serving the SAF and Singapore, we pause to reflect on our journey thus far. The SAF Medical Corps has evolved from support entities exclusive to each service to an integrated Corps providing professional healthcare and frontline operational medical support. None of these would have been possible without the sacrifice of volunteers and passion of NSF, NSmen and regular medical personnel.



Current SAF Medical Corps Leadership (Joint Medical Committee) - Taking the Medical Corps beyond MED50

“In SMTI, we do not simply train, we educate. Training prepares our people for the tasks ahead, while education future-proofs them. We start our trainees on a lifelong learning journey from the instance they stepped into SMTI, and the learning continues long after they have left us. It is this desire to learn that allows us to thrive in this volatile, uncertain, complex and ambiguous environment. It is this quest for knowledge that empowers us to seek out those in need, to save lives, and to serve Singapore always.”

- SLTC(Dr) Lee Wei Ting
Commander SAF Medical Training Institute



OUR SKILLS
WE SHARE

EVERY SOLDIER A LIFE-SAVER

Every soldier has a common start point in the SAF journey - Basic Military Training. It is here that they are equipped with life-saving skills that would prove essential, skills such as Cardio-Pulmonary Resuscitation (CPR) and Automated External Defibrillator (AED). In peace or war, day or night, our soldiers are empowered to save lives.

Thanks to a group of dedicated instructors from the CPR Centre, the SAF trains 29,000 people annually in CPR and AED. That is 29,000 more lifesavers in Singapore every year. Our instructors are professional, passionate and committed. They not only teach SAF personnel to save lives, but also educate the public on how they too, can save lives.





CPL Kenneth Tan

noticed a child lying unconscious at the bottom of the pool. He dived in, pulled her out, and performed CPR on her, ultimately saving her life.



LTA Teoh Seng Hong

from Artillery Institute, saw a man grabbing his chest and gasping for air. He grabbed the AED, shocked him and performed CPR on the victim until the ambulance arrived. Thanks to his quick action, another life was saved.



In the battlefield, cries for "Medic!" are not uncommon. Try as they may, the medics cannot reach every casualty in time. With precious minutes slipping by, it is up to the soldiers to make sure they survive to fight another day.

Since 2000, all SAF soldiers are taught Combat Buddy Aid. Combat Buddy aid covers the 3 phases of tactical care - Care Under Fire, Tactical Field Care, and Tactical Evacuation Care. Equipped with these skillsets, our soldiers are able to provide timely and lifesaving medical care to themselves and their buddy.



COMBAT BUDDY AID

CARE UNDER FIRE

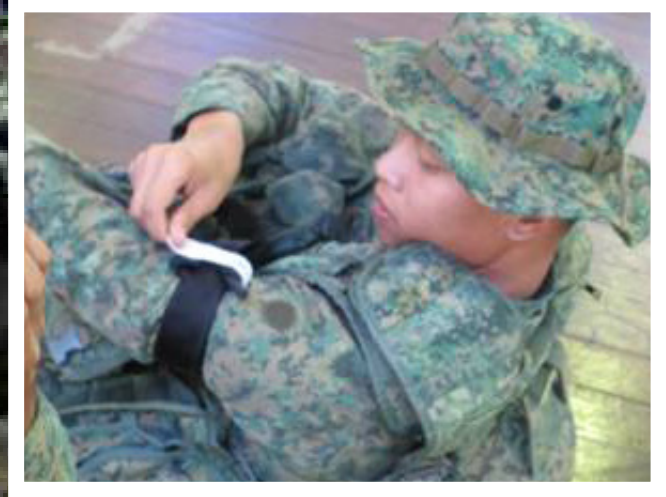
Stop life-threatening bleeding
using a tourniquet

TACTICAL FIELD CARE

M - Massive Bleeding
A - Airway
R - Respiration
C - Circulation
H - Hypothermia / Head Injury

TACTICAL EVACUATION CARE

- Various modes of casualty evacuation
- Continued assessment and management en-route





ART OF SURVIVAL





Independent operators, such as reconnaissance personnel, snipers and special signal units, ply their craft deep in hostile territory. They function independently, and must be prepared to provide medical attention to their injured buddies. They require advanced skills beyond what was taught in Combat Buddy Aid. Like the Army independent operators, Navy's First Aid Parties

are sailors who are trained to provide immediate medical interventions on board ships. These soldiers often operate in isolated environment, and as a result, require advanced medical training in order to survive.

SMTI conducts Combat Casualty Aid Course for these soldiers, equipping them with essential

skills such as bandaging, arresting of bleeding, intravenous cannulation and airway management skills. Equipped with such skills, our soldiers can provide timely medical intervention to those in need, enhancing survivability even in the most hostile environment.



Republic of Singapore Navy added 3 new photos.

This morning, a Malaysian-flagged fishing trawler capsized in Singapore waters, northeast of Pedra Branca.

When our Fearless-class patrol vessel, RSS Independence, reached the vicinity, they spotted five fishermen struggling to hang onto their capsized vessel to stay afloat. The crew of RSS Independence immediately got down with the rescue task and rescued the five fishermen. The crew quickly provided blankets for warmth as the fishermen were shivering, and gave them hot beverages. One of the fishermen, who sustained minor injuries, was also treated by the crew of RSS Independence.

Bravo Zulu, RSS Independence!

Read more about the incident here: <http://bit.ly/1V7qrCR>



22 September 2015 at 13:08 · Public

**SUCCESS
STORIES**

The RSS *INDEPENDENCE* crew rescued five fishermen from a capsized fishing trawler, and their FAP put their first aid skills to use, successfully treating a fisherman who had sustained injuries.

A MEDIC OF THE SINGAPORE ARMED FORCES

Upon graduation from Basic Military Training, some are selected to come to SMTI, for the Emergency Medical Technician course. It is here that their journey to become Medics begins.

The Emergency Medical Technician course is an 11-week programme that trains medics for SAF. It equips the trainees with the necessary medical knowledge, skills and confidence to fulfil his duties as a medic. During the course, the trainees will also learn to perform tactical combat casualty care in the combat environment. Be it at the frontline, or at the Battalion Casualty Station, our medics will be equipped with the necessary skills to save lives.





Upon completion of the course, the trainees will be qualified Emergency Medical Technicians. The SAF Emergency Medical Technician course is a Workforce Development Agency Workforce Skills Qualification certified course. This means that our medics' achievements are both recognised in SAF, and nationally.

The SAF Emergency Medical Technician Course undergoes regular reviews in order to stay updated and relevant at all times. In the most recent review in 2016, the Emergency Medical Technician Course was enhanced with new learner-centric pedagogies, and the trainees are equipped with tablets, through which interactive courseware are used to augment learning. Furthermore, our instructors receive regular training in instructional skills. By keeping the lessons interesting and engaging, our instructors captivate our trainees, and maximise their learning potential.



SERVICE WITH PASSION, COMPASSION & TOTAL COMMITMENT

Our newly minted medics are dispersed across the three services, and commence their journey as life-savers. For some medics, additional trade skills are required for their unique vocations. We will look at the 1 Medical Squadron (1MS) Medics from the Air Force, the Medical Response Force (MRF) medics from the Army, and the Underwater Medics from the Navy.



1 Medical Squadron Medics

1MS contributes to Search and Rescue support for the SAF. 1MS medics undergo winch training to enable them to be confident on the winch wire for medical evacuations from remote locations or out at sea. They also undergo helicopter underwater escape training, so that they can react safely in a helicopter emergency.





LAND

Medical Response Force Medics

MRF provides both Chemical, Biological and Radiological (CBR) & conventional medical support for casualties of CBR incidents. To become an MRF medic, medics must undergo MRF training, comprising the following components: acclimatization to the Mission-Oriented Protective Posture suit, operational competencies in a CBR environment, as well as the knowledge about various CBR agents and medical management of casualties.



SEA

Underwater Medics

All Naval Medics undergo training, comprising several modules, such as Diving Medicine, Hyperbaric Medicine and Naval Operational Medicine, to become Underwater Medics. They are expected to be operationally ready and should be able to monitor patients independently in hyperbaric chambers. They can also function independently during shipboard medical covers.

I DEDICATE MY LIFE...

MEDICAL OFFICERS

To ensure that our Medical Officers are capable of leading their medics by example, excelling in everything they do, and overcoming all adversity, they must first undergo 3 months of gruelling Medical Officer Cadet Course training. Doctors and Military Experts gain knowledge, skills and physical fitness rapidly during this intensive course, and develop strong camaraderie as they learn how to function independently as Medical Officers, work as a team to best challenging outfield exercises and casualty evacuations, and commission as a Medical Officer of the SAF.



Medical Officers then proceed to develop service-specific domain specialisation.



LAND

As part of Army's requirement, Army Medical Officers undergo training in military sports medicine to allow individual Army Medical Officers to effectively manage soldiers with musculoskeletal injuries.



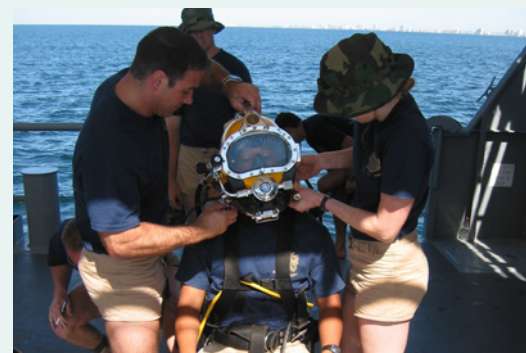
AIR

Air Force Medical Officers train in aviation medicine and physiology to provide highly specialised care for their pilots and air crew, and ensure that they retain the cutting edge over their adversary.



SEA

Diving medicine is essential for Navy Medical Officers, who learn about naval operations and undersea medicine. They acquire the knowledge and skills necessary to manage the health of divers and submariners.



LEARNING FOR LIFE

COMPONENT TRAINING

SAF medics and Medical Officers are always fully operational. They must be able to save lives not only in war, but in peace as well. Our medical personnel are heavily engaged in providing cover for training and exercises, and in healthcare delivery at medical

centres, but they must be ready to rise to the occasion when catastrophe strikes.

The Medical Officers attend monthly Grand Rounds, where they learn from esteemed physicians from hospitals, and are kept abreast of the best practices in clinical medicine. Medical Officers are also granted the opportunity to attend and learn

from local and international medical conferences. The Continuing Medical Education programme conducted by SMTI ensures that our medics continue to grow individually, gaining proficiency in their medic skills. Medics also develop team skills, mastering the 4-man resuscitation drill. Under the programme, medics undergo daily familiarisation drills and weekly emergency drills.



INTEGRATED TRAINING

The medics and medical officers conduct fortnightly, team-based medical training at their respective medical centres, and attend quarterly Protected Training Time that is conducted centrally at the Medical Simulation Training Centre, where they train to manage challenging resuscitation scenarios using High Fidelity Manikins.

Annually, our medics are assessed both individually (through the Annual Medic Proficiency Test), and as a team (through the Mobile Medical Evaluation Team). MobileMET leverages on medical simulation, and employs Hybrid Simulation – where a standardised patient (ie. actor) acts as a casualty, invoking an emotional response in the medic being assessed, before the scenario transits into a resuscitation, which is performed on a High Fidelity Manikin. This injects realism into the team-based assessment of our medical centres, and ensures that our medical centres are operationally ready.

MobileMET The Concept

MobileMET utilises simulation to assess our medical centre's resuscitation capabilities.

7. The entire process is captured on video. At the end of the assessment, the evaluation team provides feedback to the team.



1. The assessment commences with the medical centre being contacted for an unwell patient within the camp complex.



2. At the scene, the medic interacts with an actor who acts out the patient's medical condition.



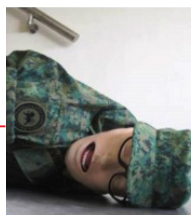
3. The actor's condition will worsen, necessitating resuscitation.



6. At the medical centre, the medical officer and his team of 4 medics are assessed on their resuscitative efforts.



5. The medic is assessed on his performance on scene and on the ambulance, en-route to the medical centre.



4. The medic will then execute resuscitation procedures on a High Fidelity Manikin.



- 1 Then ME5 Daniel Chia called for simulation enthusiasts to join the MobileMET effort.
- 2 MobileMET's Advisor, then LTC(Dr) Ng Yih Yng observing the inaugural MobileMET evaluation in 2011.

MobileMET started in 2011



OPERATIONALLY READY NATIONAL SERVICE TRAINING

After our medics and medical officers complete their full-time national service, they transit into their Operationally Ready National Service (ORNS) cycles and they continue to provide medical support for the full spectrum of SAF operations. As the majority of the NSmen medics are neither nurses nor paramedics in their civilian jobs, the medical National Service Training System ensures that, as a baseline, individual medical competencies are maintained, and team competency training with the NSmen doctors is layered on.

Some are given the opportunity to be part of a Combat Support Hospital (CSH), providing surgical support for the Army through Damage Control Surgery.



I was very thankful, it has been a privilege because I had an excellent team of officers and men with me. There was this saying 'if you want to go fast, go alone, if you want to go far, go together' "

- LTC (NS) (Dr) David Ng Chee Chin
Commanding Officer 3rd CSH

Best National Service Combat Service Support Unit, 2016





For Navy NSmen MOs and Medics, the added complexity of operating on board different naval platforms ensures that each in-camp training is both practical and meaningful. RSAF NSmen MOs and Medics have roles in the provision of frontline air base medical and psychological support, as well as in heli-medical evacuations.

In order for the the ORNS units from the Army, Navy and Air Force to achieve their mission, they require a core of committed people, building on foundations laid out during their NSF years, with structured training programmes for NSmen. Training is conducted by our uniformed regular medical trainers (Medical Military Experts) who develop deeper specialisation by undergoing advanced training in peri-operative, critical care and paramedicine. Some of the NSmen medics also undergo specialised medical courses, conducted by external agencies such as Nanyang Polytechnic. These measures ensure the maintenance of strong vocational-type and operational task competencies, and continue to engender their commitment to defence.



“Force health optimisation is one of the Singapore Armed Forces Medical Corps’ key missions. This goes beyond the traditional provision of frontline health services, incorporating a holistic approach that encompasses screening and disease prevention, to early intervention and performance optimisation. Over the years, our healthcare ecosystem of people, policy, processes and places has constantly evolved to meet the SAF’s needs and provide world-class care for our people.”

- SLTC(Dr) Lim Hou-Boon
Commander Military Medicine Institute





NO MATTER
WHEN WE'RE
BATTLE READY

THE HEALTHCARE JOURNEY OF AN SAF SERVICEMAN

Mr David Lim's NS journey begins during pre-enlistment medical screening at the Medical Classification Centre.

When an abnormality is found on his ECG, he is referred to the SAF Cardiac Fitness Centre for further assessment. It will take him less than 2 months to see a cardiologist, undergo relevant cardiac investigations and have his assessment completed.

9 months into enlistment, 3SG Lim is not feeling well and decides to report sick at his camp's medical centre that has been upgraded and refreshed with modern medical equipment. He registers his visit using the self-registration kiosks. The queue display unit shows him where to go and he watches health promotion videos on the flat screen while waiting.

During the consultation, his Medical Officer uses SAF's new electronic medical records system, PACES 3, to document clinical notes, order investigations and prescribe medications. A Physician Partner who is deployed in his medical centre is available to provide professional mentorship to the MO for the more complicated medical problems.

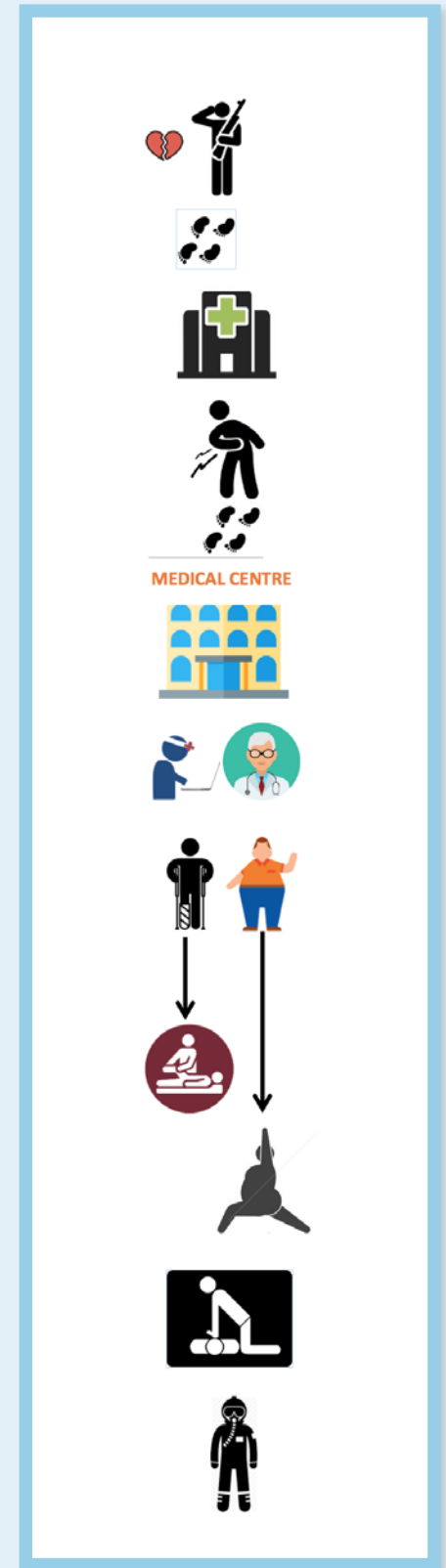
Outside the consult room, he bumps into his CO MAJ Yusof and RSM 2WO Anand.

MAJ Yusof shares that he suffered an injury and has been referred to the Orthopaedics specialist at the SAF Specialist Health Service. He also undergoes in-house physiotherapy. He feels relieved that the specialist is mindful of his career as a Regular soldier and makes treatment recommendations with his vocational requirements in mind.

2WO Anand is there for his health screening. He shares that it is a requirement for Regulars above a certain age to undergo annual health screening. This also serves as a personal reminder to look after one's health.

While making his way to the dispensary, 3SG Lim witnesses the medical team undergoing an on-site evaluation of their resuscitation skills by the Mobile Medical Evaluation Team.

What 3SG Lim has experienced is but part of the entire SAF healthcare continuum. He is reassured to know that what he has experienced at the various medical touchpoints is also backed up by robust governance systems and up-to-date healthcare policies.



SAF MEDICAL SCREENING AND CLASSIFICATION



One of the earliest memories of National Service for most people would have been to face the wall in the MO's clinic, remove their trousers and cough to look for hernias. While the idea of having a stranger stare at one's privates with one's pants around the ankles may not be the best introduction to the healthcare system in the SAF, the Medical Classification Centre (MCC) at the Central Manpower Base is often the first touch point a soldier has with the system.

During the pre-enlistment medical check-up, a pre-enlistee will undergo various screening tests. After which, a Medical Officer will go through the Medical Screening Questionnaire, perform a thorough history-taking and physical examination before reviewing the results of the investigations. Where necessary, referrals for specialised investigations or consultations are made.



Stations that pre-enlistees have to go through. Clockwise from top left: Chest X-Ray, Audiometry, Ophthalmology Examination, Dental Screening and Blood Investigations.

MCC collaborates with the Military Medical Institute (MMI) and key partners in the restructured hospitals (such as the SAF Cardiac Fitness Centre at National Heart Centre Singapore, Changi General Hospital Respiratory Medicine Department and the Institute of Mental Health) to facilitate a smooth specialist referral process and minimise administrative delays. MCC and HQMC also engage the SAF Specialist Advisory Boards regularly to ensure that the screening protocols remain up-to-date and robust.



The Medical Classification Centre team headed by LTC(Dr) Shalini, Commanding Officer MCC



MCC conducts medical screening to assign each pre-enlistee with a Physical Employment Standard (PES) grade.

The PES grade determines each serviceman's fitness for various aspects of physical and military training, in particular, assignment to a suitable vocation. This enables the SAF to optimise deployment of each serviceman. In the long term, this also helps to prevent occupational-related injuries and health issues.

A pre-enlistee who qualifies to become a diver, or wishes to become a Regular pilot, aircrew, diver or submariner will have to undergo a specialised battery of screening tests performed by Aviation and/or Diving Medical Officers. This is especially important, as personnel with medical conditions that can worsen with flying or diving and inhibit optimal performance will preclude them from being selected. The Certification and Standards Branch (CSB) under Air Force Medical Service (AFMS) and the Naval Underwater Medicine Centre (NUMC) under Navy Medical Service (NMS) oversee these processes and lay down the selection criteria for applicants.



In addition to the routine pre-enlistee screening tests, specialised tests are carried out in the Aeromedical Centre and Diving Medicine Section.

Top: Anthropometric assessment and hypobaric chamber screening at ARMC.

Bottom: Tympanometry and Spirometry are conducted to exclude candidates with high risk of aural barotrauma. In addition, a hyperbaric chamber screen is also conducted after the Diving Medical Officer has ascertained that the candidate is safe to be pressurised in the chamber.



In addition to screening of regular diver and submariner candidates, over 1,000 pre-enlistees undergo the dive screening process annually!



Lieutenant-General Perry Lim, Chief of Defence Force, intubating a high fidelity training mannequin using a video laryngoscope with the assistance of the medical centre's team.

PRIMARY HEALTHCARE PROVISION

Medical Centres are frequent medical touch points for servicemen for primary health consultations and medical administration. In recent years, the Medical Corps has operationalised new medical centres and equipment with operational requirements, sound workflow and patient comfort in mind.

For instance, for Sungei Gedong Medical Centre which reopened in 2016, a team from the Singapore University of Technology and Design collaborated with MMI to incorporate design elements to create an environment that is pleasant for both patients and staff. The design ensures that the rooms are laid out in an intuitive manner that facilitates workflow efficiency and minimises patient inconvenience.



To ensure that our servicemen get the best care expediently in the field and train with a peace of mind, the SAF Medical Corps launched the SAF Emergency Ambulance Service (EAS) in 2015. This system is premised on expedient evacuation of severe casualties to the next level of medical care. For serious casualties at training areas outside SAF camps, the EAS facilitates transfer to the nearest restructured hospital while receiving appropriate en-route medical treatment.

Dental care is also a crucial part of the primary healthcare system. Personnel being deployed overseas for more than 1 month will have to be reviewed by a Dental Officer. If required, corrective dental work can then be carried out early in order to avoid downtime caused by dental diseases when servicemen are deployed.



Mdm Karuppiah Saraswathi
Clinic Manager

STANDING ON THE SHOULDERS OF GIANTS

As a senior member of the Medical Corps, Mdm Sara has seen and done it all. She has held multiple leadership appointments throughout her career, including Course Sergeant Major, Senior Medic and Clinic Manager, and had led her people in the unwavering pursuit for medical excellence.

Mdm Sara has always been impressed by the vitality and adaptability shown by the people of the Medical Corps over the years. A fine example would be her time at Pulau Tekong during its infancy stages, where the huge number of patients on an isolated island made provision of medical care very challenging.

Her experiences with the SAF have instilled in her an appreciation of life and have made her a stronger person. She wishes SAF Medical Corps a happy 50th anniversary.

ENHANCED DESIGN OF A TYPICAL SAF MEDICAL CENTRE



Isolation Rooms

Patients with infectious diseases are quarantined here to prevent transmission.



Resuscitation Room

With direct access to the ambulance bay and BCU, severely ill patients can be rushed into the resuscitation room for immediate management or transferred out expediently for further care at the hospital.

Automated sliding doors, extended ceiling mounted examination lights, quick access shelving solutions and hydraulic emergency trolleys enhances operational readiness and response time.

Resuscitation medical equipment is similar to that of the newest public hospitals. ECG machines are able to upload readings onto PACES 3 and the addition of the video laryngoscope helps to improve success rates for difficult intubation.



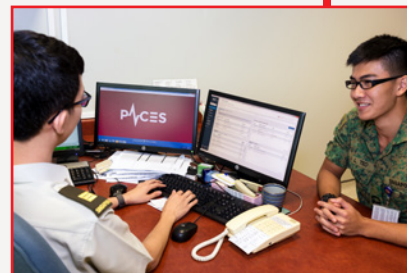
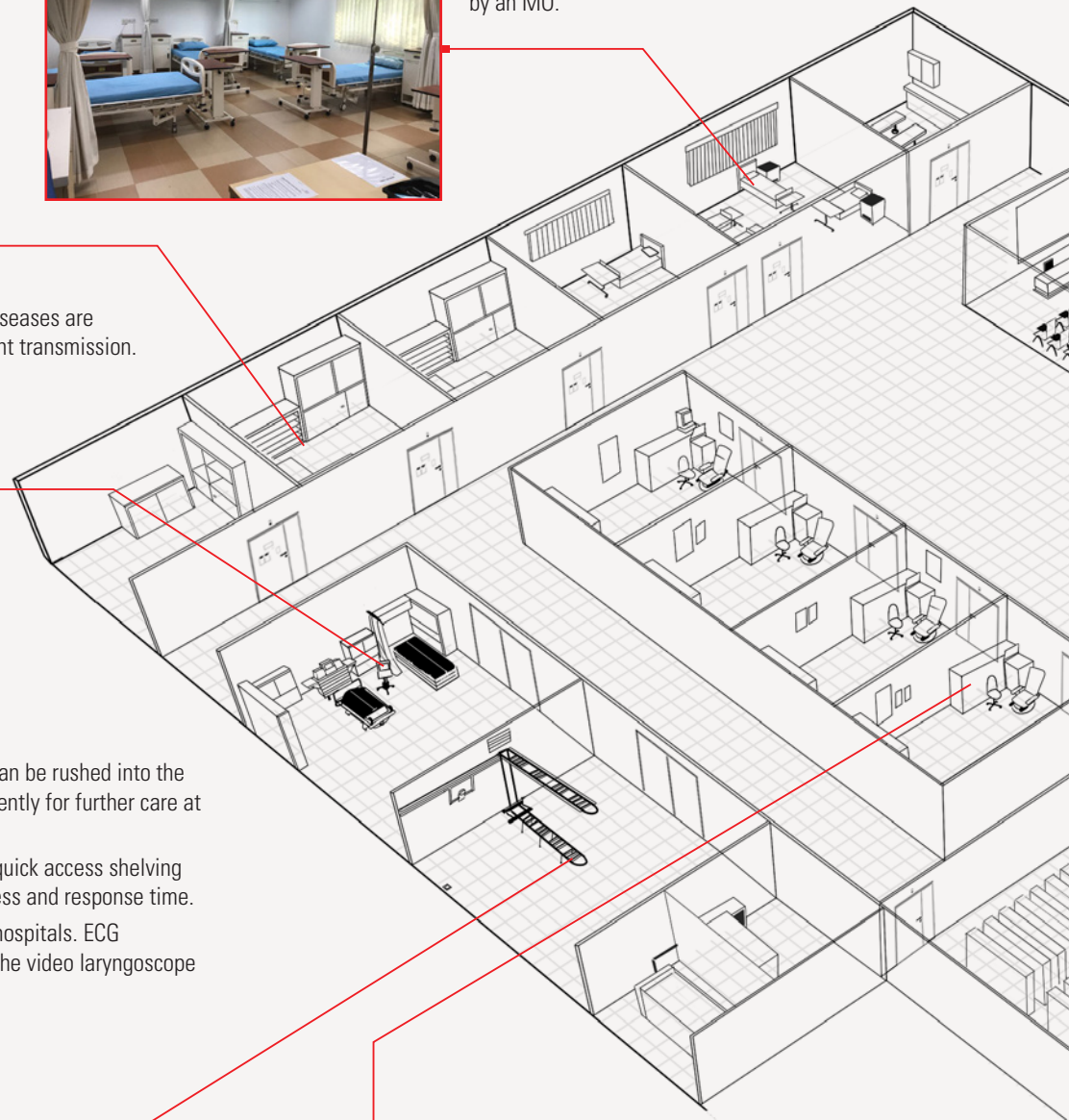
Body Cooling Unit (BCU)

The BCU enhances evaporative cooling to rapidly bring down the body's temperature, in cases of servicemen with suspected heat injuries.



Sick Bay

Patients are held here when they require further observation by an MO.



Consultation Room

With the PACES 3 system, the MOs can quickly assess the medical records of the patients to gain a holistic understanding of the patient's condition. From the same workstation, investigations, referrals or arrangement for medical boards can be ordered!

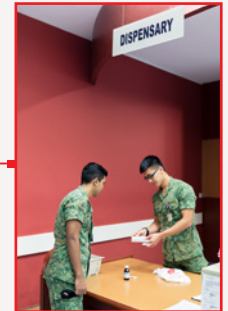


Lecture Room

The conducive environment allows for briefings and training to be conducted.

Dispensary

All dispensary medics are WSO trained and certified as a Pharmacist Assistant.



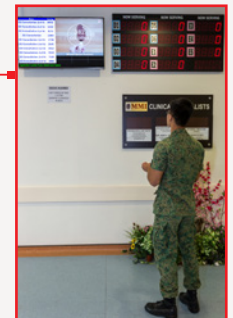
Waiting Area

Non-febrile patients are segregated from febrile patients to prevent and reduce transmission of communicable diseases. The incorporation of a skylight allows for natural lighting.



Registration

Patients can quickly and easily register with just a tap of their 11B, with no need for long queues.



Queue Management System (QMS)

Equipped with a Load Balancing Algorithm, the QMS directs patients to the various parts of the medical centre, and significantly reduces the time a patient spends there.



Triage

With the aid of an automated blood pressure machine, the medics quickly screen through the vitals of a patient. Priority to see a MO will depend on the severity of the patient's clinical condition. The vital signs and chief complaints are keyed into the PACES 3 system, where the MO can maintain oversight of the patients in queue.

SPECIALIST HEALTHCARE PROVISION

One of Specialist Healthcare Service's (SHS) key role is the provision of in-house specialist service for expedited review and assessment of servicemen for fitness for military duties. Clinics are run by Specialist Medical Officers who are SAF Regulars as well as NSmen. SHS also leverages on collaborations with national healthcare institutions to provide specialist care to our servicemen in areas with greater operational relevance to the SAF, such as psychiatry and cardiology.

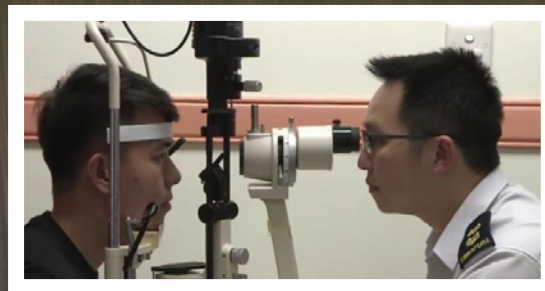
The Medical Board Centre oversees the conduct of medical boards in the SAF. At these boards, the PES grade of servicemen are deliberated on and assigned based on the nature and severity of their medical conditions. Where necessary, the boards also endorse medical certificates and excuses. Medical

Boards are chaired by a senior Regular medical officer, assisted by two other medical officers.

All RSAF Aircrew and Pilots will have to undergo an Annual Certification and Examination (ACE) to ensure fitness in carrying out their aviation duties. In the

event of any medical conditions that can adversely affect flight safety, they will be restricted from flying and referred to Aviation Medicine (AvMed) clinics for monitoring and management. Complex cases will be deliberated at the RSAF Aeromedical Board.

The care for the divers and submariners is similar. Diving fitness is recertified on an annual basis. Depending on the severity and permanence of the condition, the servicemen may subsequently be permitted by the Diving Medical Officer to return back to active diving or submarine duties with certain restrictions. Complex cases will be discussed at the Diver and Submariner Medical Board.



HEALTHCARE GOVERNANCE

Recognising the need for strong governance and professional standards that are benchmarked against the national healthcare system, a 3-tier governance system was put in place in 2011. This comprised the SAF Medical Advisory Board, four SAF Specialist Advisory Boards and 37 SAF Visiting Consultants representing 23 different clinical specialties.

"This (SAF Medical Advisory Board) allows MINDEF to say with confidence that the care they provide their servicemen, both in training as well as in managing emergencies, is comparable to what we see in a hospital. That is a commitment that MINDEF has made to its servicemen."

- COL(NS)(Dr) Kenneth Mak

SAF MAB

*Deputy Director of Medical Services (Health Services Group)
Senior Consultant, Department of General Surgery, KTPH*

The Physician Partnership Programme was introduced in 2013, to allow senior family physicians to work alongside NSF MOs to provide on-site supervision and mentorship. This has effectively deepened the medical expertise and experience at the medical centres and has engendered greater trust and confidence of both our servicemen and the public in the SAF's Medical System.



Dr Gabriel Chong, the Physician Partner based in Pulau Tekong Medical Centre, overseeing the resuscitation of a simulated casualty and training of the medical team.

The SAF Medical Advisory Board (MAB) consists of six civilian doctors in senior management positions in Singapore's healthcare system, along with the SAF's Chief of Medical Corps. Chaired by Prof Tan Ser Kiat (President of the Singapore Medical Council), the MAB serves to advise the SAF on key medical policies and strategies on its health services. The other members are Dr Paul Chui, Prof Teo Eng Kiong, A/Prof Kenneth Mak, Prof Fong Kok Yong and Prof Philip Choo.

The SAF Specialist Advisory Boards (SAB) provide guidance on the development of medical best practices in Cardiology, Emergency Medicine, Psychiatry and Respiratory Medicine. They are chaired by Prof Tan Huay Cheem, A/Prof Mark Leong, Prof Kua Ee Heok and Prof Lim Tow Keang respectively.

SAF to tap expertise of civilian doctors
Straits Times, 25 August 2012, Page 1

SAF to tap expertise of civilian doctors

Army's emergency medical support system also under review: Mindef

By IAN POH

pohian@sph.com.sg

THE Singapore Armed Forces (SAF) will soon have access to the expertise of a large pool of experienced doctors to improve the quality of care to national servicemen (NSmen).

The programme it is exploring will partner medical officers who are full-time national servicemen (NSFs) with experienced civilian doctors.

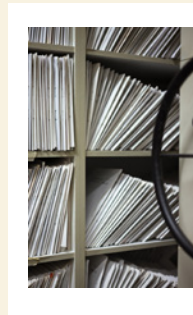
It is part of an ongoing review of the medical support system by the Ministry of Defence (Mindef) and the SAF Medical Corps to raise standards of medical care in the SAF, especially in its training institutions, said Defence Minister Ng Eng Hen yesterday. He was speaking at the opening of a new medical training facility in Nee Soon Camp.

The Physician Partners undergo a rigorous selection process in which prior NS experience and being officers of good standing is as important as clinical experience and having the relevant post graduate qualifications in family medicine.

PATIENT CARE ENHANCEMENT SYSTEM

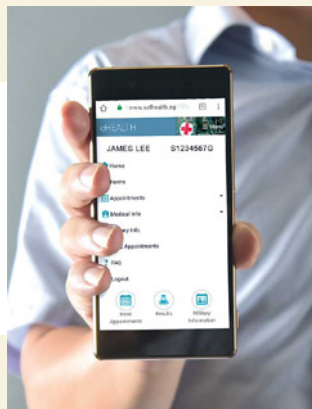
The SAF's third generation Electronic Medical Records (EMR) system, PACES 3, was rolled out in 2016. Based on an established system used by several of Singapore's public hospitals and numerous medical institutions worldwide, PACES 3 has been customised to meet the SAF's requirements. It has unprecedented functionalities and connectivity, allowing greater workplace efficiency and more comprehensive care for patients.

Medical officers are now able to access the National Electronic Health Record (NEHR) database and the national Critical Medical Information System (CMIS) for relevant medical history and other pertinent information from the serviceman's medical records. PACES 3 also allows users to order laboratory and radiological investigations as well as receive and record the test results directly.



Hardcopy medical dockets (SAF1005) required a large amount of resources to generate and transport from camp to camp. These documents would follow a serviceman's postings and be stored for many years after his ORD.

Another key feature of PACES 3 is its internet eHealth portal, which allows servicemen to access and print their SAF Medical Certificates, PES status certificates and Medical Excuses. In addition, PACES 3 features a push-based SMS reminder system to inform servicemen of their upcoming appointments or missed appointments.



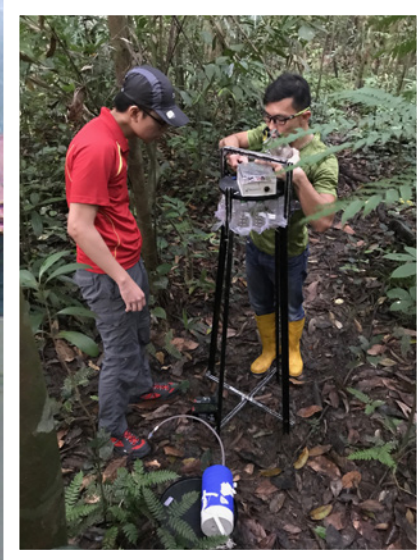
COL(NS)(Dr) Gan Wee Hoe won the Champion for Health IT award 2017 for leading the charge to develop PACES 3

RADM(Dr) Tang Kong Choong, Chief of Medical Corps, receiving the National IT Excellence Award 2017 from Mr Gan Kim Yong, Minister for Health, for achieving healthcare excellence via PACES 3.

FORCE HEALTH PROTECTION

The prevention of pandemics and endemics are key components to maintaining force health. Biodefence Force Centre (BDFC) plays a key role through constant monitoring of disease trends and detection of changing patterns which may signal potential outbreaks. The Acute Respiratory Infections (ARI) surveillance programme is a good example of a regular surveillance project.

Vaccination is a very effective tool in disease prevention. BDFC formulates all its vaccination policies carefully via an evidence-based approach in consultation with an Expert Committee of Immunisation (ECI). All recruits in the SAF are given a battery of vaccines to protect them against various diseases. Certain high-risk vocations are given additional vaccinations. The Annual Influenza Vaccination Exercise (AIVE) is an exercise in which every serviceman is vaccinated with the influenza vaccine, protecting against 3 subtypes of influenza. Before an overseas deployment, servicemen are also vaccinated against local endemic diseases.



The Zika virus outbreak in August 2016 is a good example of how BDFC manages emerging threats. After notification of the 1st case of Zika virus infection in an SAF serviceman, immediate containment measures were taken to mitigate the impact of Zika virus in our servicemen. This included a review of medical records to conduct a “look-back” screening of possible Zika cases within the same camp, environmental audits of affected camps, enhanced vector control measures and education outreach to all commanders and servicemen.



The Annual Influenza Vaccination Exercise (AIVE) has led to an estimated 80% reduction in influenza infections!

HEALTH PROMOTION



Every year, close to 20,000 young Singaporean males are enlisted into national service. They go on to become NSMen who return for in-camp training for the next 10 or more years. This renewed “captive” audience represents an excellent opportunity for health promotion. By encouraging good practices, weight management and smoking cessation, MMI’s health promotion efforts can play a major role in the health of a large proportion of Singaporeans.

The Health Promotion team in MMI conducts regular health education for our soldiers to equip them with the knowledge to manage and improve their health and productivity. These include conduct of health talks, sharing of materials and coordination with SAF units to organise healthy lifestyle events for the soldiers. MMI, in collaboration with Health Promotion Board, has implemented programmes to help tobacco users quit smoking and partnered with public sector hospitals for weight management clinics for obese and pre-obese servicemen.



SAF cookhouses have started serving mixed brown rice, which has higher fibre and nutrient content than white rice.



In 2016, as part of the National Smoking Cessation OutREach (SCORE) programme, MMI trained its hundredth ambassador!



Ng Eng Hen

Like This Page · November 4, 2016 · Edited ·

ME3 Ho Quck Chan from the SAF Medical Training Institute shared how his daughter once looked at him with tearful eyes after seeing him with a cigarette. His relationship with his daughter improved after he stopped smoking. ME3 Ho now warns his servicemen of the dangers of smoking when he sees them light up.

Smoking Cessation Outreach Ambassador, ME3 Ho Quck Chan being featured on Minister of Defence’s Facebook.



The Singapore Health Excellence Award was conferred to MINDEF and the SAF, the RSN and the RSAF for workplace health promotion in 2017. The awards were received by (from left) COL(Dr) Chow Weien, SLTC(Dr) Lim Hou-Boon and SLTC(Dr) Benjamin Tan.



Oral Health Roadshow in Nee Soon Camp



HEALTH SCREENING PROGRAM

The SAF Health Screening Programme was started in 2011. This amalgamation of various health screening initiatives into one unified programme comprises a comprehensive set of screening tests and has enabled the Medical Corps to deliver universal health screening to SAF and MINDEF personnel to safeguard force health and ensure that servicemen remain medically fit to meet organisational and operational demands. The programme also serves to identify and stratify the medical risks faced by each individual, thus empowering them to assume personal responsibility in maintaining overall wellbeing.

Over the years, the Health Screening Programme has helped diagnose more than 5,000 new cases of cardiac conditions, hypertension, hyperlipidemia and diabetes!



SAF HEALTH SCREENING PROGRAMME

HSP is aimed at safeguarding health for the workforce and ensuring that servicemen are medically fit to meet organizational and operational requirements. It aims to detect medical conditions (i.e. Heart disease, common cancers) for the purpose of early intervention

Panel 1: Basic	ECG, URINE, OPTIC, BLOOD TEST	OUTCOMES
Panel 2: Multiphasic Screening (For regulars)	BLOOD TEST + AUDIOMETRY + STOOL TEST (Cancers, Cardiovascular, HSP Single)	Low Risk: Fit for IPPT/AAFT/SPFT
Panel 3: Advanced Cardiac Investigation	STRESS TREADMILL + STRESS ECHOCARDIO + CALCULUS SCORING	Moderate Risk: Fit for SPFT only
High Risk:		Unfit for IPPT/AAFT/SPFT

Panel 1	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Panel 1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel 2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Panel 3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Booking of Appointment
Medical consultations are only available in the afternoon and can be booked via resource web. Blood tests should be completed at least 1 week before the scheduled Medical Officer consultation. Blood tests are conducted in the morning (9am - 11am) from Monday to Thursday. Booking of appointment is not required for blood test.

CAK: 24 Feb 2015

CHRONIC DISEASES

DIABETES MELLITUS	HYPERLIPIDEMIA	HYPERTENSION																												
<p>What? Diabetes is a long term condition in which the blood glucose levels of a person remain persistently higher than normal. It occurs when the pancreas does not produce enough insulin or when the body cannot effectively use insulin.</p> <p>Who are at risk? Usually in people over 40 years old, particularly those who are overweight and physically inactive.</p> <p>How is it diagnosed? Diabetes can be detected through a blood glucose test.</p> <table border="1"> <thead> <tr> <th>Test</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Random Blood Glucose</td> <td>≥ 11.3mmol/L</td> </tr> <tr> <td>Fasting Blood Glucose</td> <td>≥ 7.0mmol/L</td> </tr> </tbody> </table> <p>Complications: Heart disease, stroke, kidney failure, blindness, infections, peripheral neuropathy.</p> <p>Treatment: Manage your weight, eat a balanced diet, exercise, take medication as prescribed, limit alcohol, control weight: keep BMI less than 23kg/m² but not below 18.5kg/m².</p>	Test	Target	Random Blood Glucose	≥ 11.3mmol/L	Fasting Blood Glucose	≥ 7.0mmol/L	<p>What? Hyperlipidemia refers to high fat content in the blood. The amount of cholesterol in your blood comes from what is made in your liver and the food you eat.</p> <p>Who are at risk? Genetic predisposition, history of Diabetes, smokers, physically inactive, overweight, a high calorie diet, high alcohol consumption.</p> <p>How is it diagnosed? Cholesterol can be detected through a fasting lipid blood test (taken after fasting for at least 8 hours).</p> <table border="1"> <thead> <tr> <th>Test</th> <th>Target</th> </tr> </thead> <tbody> <tr> <td>Total Cholesterol</td> <td><5.2mmol/L</td> </tr> <tr> <td>LDL Cholesterol</td> <td><3.4mmol/L</td> </tr> <tr> <td>HDL Cholesterol</td> <td>1.0 to 1.5 mmol/L</td> </tr> <tr> <td>Triglycerides</td> <td><2.3mmol/L</td> </tr> </tbody> </table> <p>Complications: Excess cholesterol causes narrowing and hardening of the blood vessels. This leads to heart attacks, stroke and peripheral artery disease (narrowing of the blood vessels of the limbs).</p> <p>Treatment: Quit smoking, healthy diet, take medication as prescribed, limit alcohol, control weight: keep BMI less than 23kg/m² but not below 18.5kg/m².</p>	Test	Target	Total Cholesterol	<5.2mmol/L	LDL Cholesterol	<3.4mmol/L	HDL Cholesterol	1.0 to 1.5 mmol/L	Triglycerides	<2.3mmol/L	<p>What? Hypertension or high blood pressure refers to the condition in which the blood is pumped around the body at too high a pressure.</p> <p>Who are at risk? 95% of cases have no specific cause. Risk factors include obesity, diabetes, smoking, lack of exercise and high salt intake.</p> <p>How is it diagnosed?</p> <table border="1"> <thead> <tr> <th>Blood Pressure</th> <th>Systolic BP (mmHg) (Top Number)</th> <th>Diastolic BP (mmHg) (Bottom Number)</th> </tr> </thead> <tbody> <tr> <td>Normal</td> <td>Less than 130</td> <td>Less than 80</td> </tr> <tr> <td>Borderline</td> <td>130-139</td> <td>80-89</td> </tr> <tr> <td>High</td> <td>140 or greater</td> <td>90 or greater</td> </tr> </tbody> </table> <p>Complications: Coronary heart disease, heart failure, stroke, peripheral artery disease (narrowing of the blood vessels of the limbs), kidney failure.</p> <p>Treatment: Quit smoking, start exercising, maintain a low salt diet, manage stress, take your medication as prescribed.</p>	Blood Pressure	Systolic BP (mmHg) (Top Number)	Diastolic BP (mmHg) (Bottom Number)	Normal	Less than 130	Less than 80	Borderline	130-139	80-89	High	140 or greater	90 or greater
Test	Target																													
Random Blood Glucose	≥ 11.3mmol/L																													
Fasting Blood Glucose	≥ 7.0mmol/L																													
Test	Target																													
Total Cholesterol	<5.2mmol/L																													
LDL Cholesterol	<3.4mmol/L																													
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CAK: 24 Feb 2015



Information on the Health Screening Programme and Chronic Diseases are displayed prominently on the walls of Changi Naval Medical Centre

WAY AHEAD

Optimising Force Health is a key enabler in enhancing SAF's operational readiness. Looking ahead, the Medical Corps must respond to these emerging threats and socio-economic challenges and support the SAF in achieving mission success. To maintain SAF's fighting force, the Medical Corps will need to optimise the classification and deployment of our servicemen and women, reduce medical attrition and explore new ways of engendering health ownership in the SAF.

"... people are the foundation of any successful system. You can have the best IT system, the most modern equipment, and robust policies. However, everything hinges on the frontline person who finally delivers the healthcare needed by our patients. Supported by dedicated supervisors, senior medics and talented medical officers, our healthcare system has punched above its weight and provided services that we can be proud of. Is it perfect? Of course not. There will always be room for improvement, and there are days when we know we could have done better. But the resilience of our people, their ability to adapt, improvise and improve, are the secrets to success."

- LTC(NS)(Dr) Lionel Cheng
Comd MMI (2011 - 2012)

“We should always consider ourselves fortunate to have had the opportunity to undergo medical training and be proud of our vocation as medical men and women. We must put this training and our skills to use in the service of others in need. We seek no other purpose; not for fame nor glory.”

- LTC (Dr) Adrian Tan

MOIC Primary Healthcare Team, Boxing Day Tsunami 2004
Dy Commander Medical Team, Central Java Earthquake 2005
Dy Commander Medical Team, Bali Bomb Blast 2006
Medical Team Leader, Ops Blue Ridge 2008/09
Medical Team Commander, Ops Swift Lion Nepal 2015
Mission Commander Medical Team, Iraq 2017

BRING CARE THAT THEY DESERVE



1. Operation Palm (Cyclone), East Pakistan, 1970
2. Operation Thunderstorm, 1975
3. Earthquake, Bali, 1976
4. Hotel New World, 1986
5. Operation Lion Heart (Earthquake), Philippines, 1990
6. Operation Nightingale, Saudi Arabia, 1991
7. Operation Blue Cross, Guatemala, 1997
8. SilkAir Flight MI185, 1997
9. Operation Blue Heron, East Timor, 1999 - 2003
10. Operation Flying Eagle (Earthquake), Taiwan, 1999
11. Operation Flying Eagle (Earthquake), Bengkulu, 2000
12. Operation Flying Eagle (Tsunami), Aceh, 2004
13. Operation Flying Eagle (Earthquake), Nias, 2005
14. Operation Flying Eagle (Earthquake), Yogyakarta, 2006
15. Operation Swift Lion (Earthquake), Padang, 2009
16. Operation Blue Sapphire (Maritime), Gulf of Aden, 2009-2015
17. Aeromedical Evacuation, Pensacola Naval Station (USA), 2012
18. Aeromedical Evacuation, Brunei, 2013
19. Aeromedical Evacuation, Darwin, 2014
20. AirAsia QZ8501 Search-And-Locate, Java Sea, 2014
21. Operation Swift Lion (Earthquake), Nepal, 2015
22. SAF-VPA Joint Medical Mission, Vietnam, 2015
23. Combating Transboundary Haze, Thailand & Indonesia, 2015
24. ADMM-Plus Military Medicine and HADR exercise, Thailand, 2016
25. Exercise Komodo, Indonesia, 2016
26. Multinational Efforts against ISIS, Iraq, 2017

MILESTONE MISSIONS OF THE SAF MEDICAL CORPS

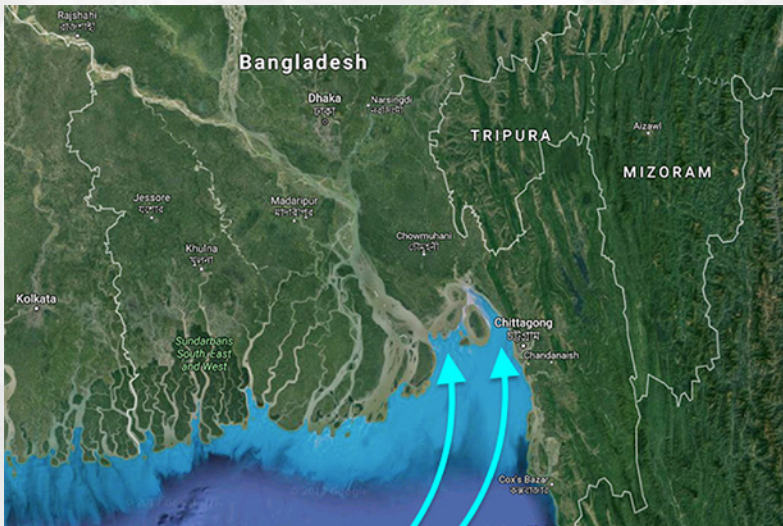
“We share a common humanity with those who have been hit. We had to act and try and make a difference to them.”

- **Prime Minister Lee Hsien Loong**

at the Tsunami Disaster Memorial Service on 9 Jan 2005

OPERATION PALM (1970) - EXTENDING AID TO VICTIMS OF CYCLONE BHOLA

SAF MEDICAL CORPS' FIRST HUMANITARIAN AID AND DISASTER RELIEF (HADR) OPERATION



Cyclone BHOLA's path of destruction.

On 12 November 1970, Cyclone Bhola, the deadliest ever recorded in world history, hit East Pakistan (now known as Bangladesh), leaving a death toll of approximately 300,000 in its wake. On 1 December 1970, then CPT(Dr) Seet Lip Chai led a medical team of 47 to provide relief aid.

"There were hardly any buildings left standing apart from a few concrete shelters and although it was almost three weeks after the event when we arrived, dead bodies of animals and the occasional human could still be seen... "While most of the emphasis in military medicine training is on trauma management, in such missions, the need is for training in the less glamorous health and sanitation management. It should not be forgotten that in most conflicts, there are more casualties from disease than trauma."

- COL(Ret)(Dr) Seet Lip Chai
Mission Commander

Aside from preventive medicine, the team also assisted local health authorities by providing primary healthcare to the locals. A second clinic was also set up in Sandwip on 4 December 1970.

"The most challenging part of the mission was having to carry a BCS (Battalion Casualty Station) bag and moving from village to village by bicycle to vaccinate as many people as we could. Little children were most afraid of being vaccinated so we had to bribe them with sweets. Villages were very far apart, as such, I do believe we covered about 10 km a day."

- 1WO(Ret) Edwidge Desker
Combat Medic

On 22 December 1970, the medical team accomplished its mission and returned to Singapore. Over the 16-day deployment, the team managed to vaccinate a total of 26,786 people. Medical supplies were also donated to the local medical authorities. 15 tons of canned food was forwarded to local relief centres for distribution to victims of the disaster.



Then-CPT(Dr) Seet Lip Chai and his medical team.

HOTEL NEW WORLD COLLAPSE (1986) - RESPONDING TO OUR NATION'S EMERGENCY

SAF MEDICAL CORPS' FIRST LOCAL HUMANITARIAN AID AND DISASTER RELIEF (HADR) OPERATION

On 15 March 1986, at 11.26 am, Hotel New World, a one-star budget hotel situated at the junction of Serangoon Road and Owen Road collapsed due to structural defects and poor-quality construction. The SAF responded immediately to the distress call from civil authorities. Chief Medical Officer, then LTC(Dr) Lim Meng Kin, was appointed to command the medical rescue operation. Within an hour of the collapse, SAF ambulances had arrived at the scene.

"Upon arrival at the scene, we saw chaos. The 6-storey building had collapsed and sunken. It was hard to believe a building will collapse in Singapore, with numerous casualties waiting for rescue."

- ME4(Ret) Lim Swee Hean



An emergency rescue post was set up across the street to facilitate operations. RSAF UH-1H helicopters were also on standby at the nearby Farrer Park football field, ready to evacuate rescued victims to the Singapore General Hospital. Rescue operations were hampered by the fact that the rescue personnel were neither trained nor equipped to deal with such a situation. Initial attempts to clear the rubble created problems for the firemen who were tunnelling beneath it to reach survivors. The authorities then called in tunnelling experts from Britain, Ireland and Japan, who were stationed in Singapore at the time for the construction of the Mass Rapid Transit (MRT) subway.

The tunnelling experts were incredibly worried that the involvement of heavy machinery will cause the rubble to fall on people who were trapped. They resorted to a risky method — to reach the trapped survivors by digging tunnels through the rubble. Several SAF doctors took turns to crawl into tunnels to change intravenous drips, assess injuries and comfort trapped casualties, at the risk of being buried if the rescue tunnels collapsed.

Additionally, cars that were in the basement carpark of Hotel New World were also crushed during the collapse. The resulting petrol leak was a major hazard for rescue teams – a single spark could lead to a gigantic explosion. Water and petrol had to be pumped out of the carpark before rescue teams could continue, hence delaying operations.

“I can still remember the evacuation of the last casualty, Mdm Chua Kim Choo, via ambulance to Farrer Park Helipad for heli-evacuation to SGH. As I watched over her in the ambulance cabin, the joy over her survival after 83 hours cannot be expressed with words. The fighting spirit in her was a good push for all of us in this time of crisis.”

- ME4(Ret) Lim Swee Hean



Then LTC(Dr) Lim Meng Kin at ground zero coordinating medical support efforts.

Rescuers managed to pull out 17 survivors as well as retrieve the bodies of 33 other victims. During the seven-day rescue effort, SAF doctors and medics displayed commendable mental and psychological fortitude to serve the nation in her hour of crisis.

“Have the gumption to change the way you do things if it achieves the objectives even though it may not be “SOP”. Do not be afraid to rewrite the SOP if need be. After all, these SOPs were written by people based on a set of assumptions. If you believe the assumptions are no longer valid - rewrite the SOP. Be sure to understand the premise or assumptions of the lesson given in the training.”

- COL(Ret)(Dr) Richard Tan

OPERATION NIGHTINGALE (1991) - CONTRIBUTING TO THE INTERNATIONAL COALITION DURING THE FIRST GULF WAR

SAF MEDICAL CORPS' FIRST PEACE SUPPORT OPERATION (PSO)

In 1991, Singapore provided medical assistance as part of the United Nations' Peace Support Operation during the Persian Gulf War. The SAF Medical Corps was activated for Operation Nightingale, our first ever PSO. A medical team comprising of 30 men led by then MAJ(Dr) Tan Chi Chiu, was flown in on 20 January 1991, assigned to the British 205th General Hospital and British Aeromedical Evacuation Teams.

One of the major risks the team faced was the SCUD missile attacks. Within hours of the team's arrival, a missile alert went off. Although it turned out to be a false alarm, it served as a valuable rehearsal for a real attack a few hours later. Air raid sirens were so frequent in the first few nights that the team became adept in donning their gas masks and chemical suits at a moment's notice to protect themselves.



Then MAJ(Dr) Tan Chi Chiu, in consultation with his British colleagues in Rear Hospital, Riyadh.



Then LTC(Dr) Surya Kumar attending to a child and his father.

"When the team arrived, we heard missile alarm. We were told to don our CD suit and prepare for impact. At that moment while preparing for the worst, I could see my life history flashing before me and that was going to be the end. Hence, appreciate every moment of your life before it flashes in front of you and that is your last."

- ME3 Mohd Fauzi
Senior Medic

thanks Singapore for Ops Nightingale



**King Fahd Ibn Abdul Aziz
Custodian of the Two Holy Mosques**

*This letter was sent from King
Fahd to President Wee in appreciation of
the Ops Nightingale team.*

*Letter of appreciation from
King Fahd Ibn Abdul Aziz to
then President, the late Mr
Wee Kim Wee.*

*Royal Embassy of
Saudi Arabia
Singapore*



مِنَعَاوِرِ
مِنَعَاوِرِ

TRANSLATION OF MESSAGE

His Excellency
Mr Wee Kim Wee
President of the Republic of Singapore

Your Excellency

It is my pleasure to express on my behalf and on behalf of the people and Government of the Kingdom of Saudi Arabia, Your Excellency, the sincere feeling of gratitude and appreciation to your immediate response in the participation of the Medical Services Team on land in supporting the Saudi Army to perform its duties defending the truth and protection of countries after God has enabled us by His aids and might to support the truth, execute justice, spreading peace and establish the international legality in liberating Kuwait from the claws of tyrannical occupation that had been planned and executed by the ruler of Iraq.

It is indeed gratifying to know that your standing by us left an indelible mark in the victory of the plan aimed for the Operation of the Desert Storm.

I am in praise of what we had noticed of the Medical Services Team for their high-spirits and their remarkable competence and wish to direct to Your Excellency, to the people and Government of friendly Singapore, best of wishes and hoping your country all the continued advance prosperity, peace and stability.

Your Excellency, please accept my cordial affection and consideration.



During their 54-day long mission, the team helped to develop and improve medical and nursing procedures in the wards and operating theatres. They also conducted a series of in-house lectures on topics such as the management of respiratory problems.

The mission was successfully completed on 13 March 1991 and the Operation Nightingale team returned to Singapore safely. It was a tough but enriching experience. For their gallant efforts, the team members were presented with the SAF Overseas Service Medal (Operational Service). The team leader, then MAJ(Dr) Tan Chi Chiu, was also presented with the prestigious King Abdul Aziz Medal (Third Class), as a token of appreciation from King Fahd of Saudi Arabia for the medical services provided by the team. Lastly, the British Defence Ministry also awarded the Gulf War Medal to 24 of the Singapore team members.

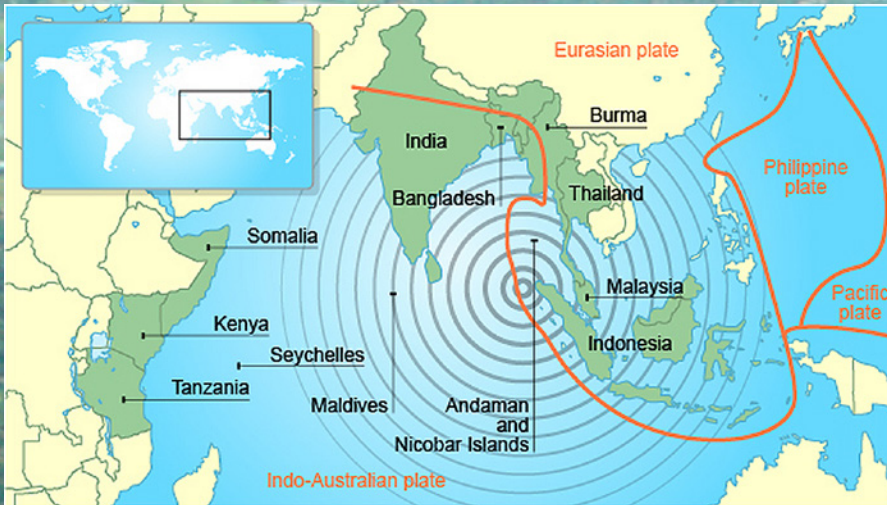


"From my participation in this Operation, I realised how fortunate we are to have peace and stability in our region and no imminent threat or war. Having conversations with badly wounded coalition servicemen and women and hearing them talk about their fallen comrades as well as their loved ones – it really changed my outlook on life. War becomes real and it hits you when you see a wounded soldier who has loved ones and aspirations like any one of us."

- COL(Ret)(Dr) Surya Kumar
Advance Party

OPERATION FLYING EAGLE (2004) - RESPONDING SWIFTLY TO THE BOXING DAY TSUNAMI 2004

SAF MEDICAL CORPS' LARGEST HUMANITARIAN ASSISTANCE AND DISASTER RELIEF (HADR) OPERATION



Areas impacted by the Boxing Day Tsunami in 2004.

Operation Flying Eagle (OFE) was the largest tri-service Humanitarian Assistance and Disaster Relief (HADR) Operation undertaken by the SAF. After a huge earthquake measuring 9.0 Richter Scale occurred off the west coast of Northern Sumatra on 24 Dec 2004, it brought tsunamis crashing onto the coasts of 12 countries.

In the aftermath of the disaster, standby teams were deployed within 24 hours and specially assembled teams for disaster relief missions were ready for deployment within 72 hours. For this mission that lasted over a period of two months from 28 December 2004 to 25 February 2005, more than 1,200 SAF personnel were deployed to Aceh alone.



“We were staying in one of the buildings. There were a lot of tents pitched for the displaced personnel and the school also had a series of noticeboards. After the disaster, the entire row of noticeboards were filled with the names of missing people. List after list after list of people who just cannot be found put up by hopeful relatives. It was a very sobering experience.”

- COL(Dr) Lo Hong Yee
Medical Team 1, Rotation 1



It was not uncommon to see boats moved many miles inland by the tsunami.

“The unity of the locals in the aftermath of the tsunami was what I observed to be extraordinary; how the locals in the midst of the chaos went about in their small little groups daily to recover the decomposing bodies that were still trapped under the collapsed structure of houses, in ditches and in the most unimaginable places”

- DX11 Patrick Lam
Medical Team 2



“The sheer will of the people to survive and overcome the obstacles galvanised the team, everyone put in their best efforts. Some wounds were festering with maggots coming out from the dead flesh. It was a horrible sight to behold. Undaunted, the surgical team was able to complete their duties expertly and professionally”.

- LTC(NS)(Dr) Chong Si Jack
Medical Team 1



In closely knitted communities, news spread very quickly by word of mouth. During the relief efforts, news travelled within the villages “as fast as Channel News Asia”. Even without advanced technology or newspapers, word of the SAF team’s aid spread rapidly throughout the village community.



Three RSN Landing Ships Tank (LSTs), eight Republic of Singapore Air Force (RSAF) Chinook Helicopters, four RSAF Super Puma Helicopters, six RSAF C-130s and two RSAF Fokker 50 as well as heavy equipment and engineering plants were deployed to the affected areas in Medan, Banda Aceh and Meulaboh in Indonesia as well as Phuket in Thailand.



The SAF’s operations included the search, locate and evacuation of victims, delivering emergency relief operations, providing logistical relief as well as aiding in the reconstruction efforts. In total, the SAF donated S\$400,000 worth of relief supplies which included tents, groundsheets, blankets and medical supplies. The SAF also deployed engineers and medical teams to provide reconstruction and medical assistance to affected areas. On 21 January 2005, the SAF handed over the recovery and reconstruction work to the Indonesian government, NGOs and other Singapore government agencies. OFE was a great testament to the SAF’s professionalism and readiness to lend a helping hand to our neighbours.

OPERATION BLUE RIDGE (2007-2013) - COMMITMENT TO THE GLOBAL WAR ON TERROR

SAF MEDICAL CORPS' FIGHT AGAINST TERRORISM

From 2007 to 2013, SAF Medical Corps contributed to the coalition's reconstruction efforts in Afghanistan. A total of 1 dental, 1 surgical and 5 medical teams were deployed. These teams included NSmen medical personnel such as dentists, surgeons, anaesthetists and nurses. A total of 2,552 patients were attended to in the Resuscitation Room and General Ward. 85 patients also received surgical treatment and 1,306 dental procedures were performed.



Performing an eye examination on a trauma patient.

The deployment also provided an opportunity for the Singapore team to interact with foreign counterparts, comprising Dutch and Australian teams.



Surgical procedure being performed on a patient's left hand.

"... our people were really homesick and they looked forward to some home-cooked food. So some of them decided to do some cooking inside their bunk, some big time 'Zi Char'. They got their Prima Deli paste and some curry and started cooking, setting off the fire alarm. Once again they shut down the whole cluster, everyone fell in and was like "where's the fire?!" The door creaked open and 2 SAF soldiers came out with the smell of food. As the medical commander, I was very apologetic, but I do understand that our soldiers really missed home-cooked food.

We capitalised on it, during the social night, we volunteered to take over the kitchen and we cooked all types of Singaporean cuisine for the whole camp. We had curry, biryani, papadum. We also put on the chef's gown and we not only cooked but served as well. I had a great time, and I am sure all of us did."

"As previous missions I participated in were mainly humanitarian missions, Oruzgan was a very foreign and dangerous environment. Compared to aftermaths of disasters, where the environment was our main enemy, the main threat in Oruzgan came primarily from trajectory attacks and conventional military attacks.

There were numerous wounds that were caused by blast and ballistic mechanisms, another new experience for me in my 20 years of service. During OBR, I held, for the first time in my life, a real, amputated leg in my own arm. It really made me question all the training I had before this, made me ponder if the techniques I learnt were effective or otherwise."

- ME3 Mazlan Mohd Khalid
Nursing Officer



MAJ(Dr) Bernard Tan performing a dental procedure.

- COL(Dr) Lo Hong Yee
Medical Commander

“When I was first deployed for PKO in Timor Leste in the early 2000s, every step from planning to pre-deployment preparation to onsite execution was more tedious than today. In those days, while the Internet was already available, medical intelligence in the areas of operation were not as rich and accessible as today. We had to rely heavily on in-theatre site surveys and therefore, make real time changes to our standard operating procedures. Medical logistics preparation was also manually indented and packed, line item-by-line item, with the same methodology used for stock accounting during the deployment.”

- COL(NS)(Dr) Gan Wee Hoe



RECENT
MISSIONS

FROM
2012 TO 2017

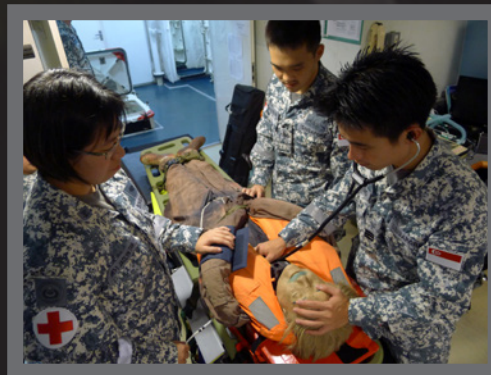
OPERATION BLUE SAPPHIRE (MARITIME) (2009 - 2015) - COUNTER-PIRACY EFFORTS IN THE GULF OF ADEN

RSN deployed Frigates and Landing Ship Tanks to the Combined Maritime Forces international coalition counter-piracy operations in the Gulf of Aden from 2009 to 2015. The task force conducted deterrence and surveillance patrols within the International Recommended Transit Corridor (IRTC) to deter piracy. These coalition patrols significantly reduced successful pirate attacks over the years of deployment.

In a prolonged maritime deployment with limited access to advanced medical care, ensuring the optimal health of the shipcrew falls on the shoulders of the organic shipboard medical team. This team is responsible for the provision of frontline primary healthcare, management of emergencies and development of the medical support plans.

“OBS(M) was a challenging experience as it was a long deployment. It was both interesting and nerve-wrecking to treat patients requiring close monitoring in the small medical centre.”

– **ME2 Jaclyn Tan**
Shipboard Medical Team Senior Medic



Organic Shipboard Medical Team conducting medical drills in the Frigate's medical centre.



Severe casualties will require expedient MEDEVAC via the Naval Helicopter.

OPERATION SWIFT LION (2015) - NEPAL EARTHQUAKE

A massive seismic event struck Nepal on 25 April 2015, leaving an estimated 8,000 killed and 19,000 injured. Upon receiving news, the SAF assembled a 15-man Primary Healthcare Team to contribute to disaster relief efforts.

The SAF worked hand in hand with Changi Regional HADR Coordination Centre (RHCC) to plan and ensure mission success. Changi RHCC provided a real-time common operating picture that showed where help was needed most as well as the locations of the various deployed teams. Three doctors and four nurses from the Ministry of Health (MOH) as well as eight personnel from the Royal Brunei Armed Forces (RBAF) also worked together with the SAF medical team to render aid to those in need.

Upon arrival in Nepal, the team spent an icy night along with hordes of international aid teams in a field near the airport. The next day, the team commanders sprang into action obtaining vital medical intelligence from the Nepalese Army and deciding on the best site to deploy medical assets.



MAJ(Dr) Jonathan Lim, ME2 Thomas Por and two MOH Personnel attending to an injured child.

Destroyed house in the aftermath of the Gorkha earthquake.



ME1 Shorini and a Royal Brunei Armed Forces soldier attending to an infant and his mother.



Attending to an elderly patient with asthma exacerbation.

The medical team also reached out to isolated populations in the mountains where casualties had limited access to healthcare. The Nepalese army provided 4WD vehicles which brought the team to the medical outposts of the villages. Medical and nursing students hiked for long hours to assist us with translations at the clinic. Locals who once hoarded supplies cooked generous meals for the medical team.

“It was apparent to us that the earthquake did more than just damage the architecture. It generated a rift across all social strata. The primary earthquake and daily aftershocks caused people to stay out of their houses for fear of being crushed alive. They ceased running businesses and started hoarding supplies. There were long queues of people waiting for buses to flee Kathmandu for the suburbs where they can get food and water. Multiple angry breakouts against the Nepalese police were seen and people mobbed the aid-workers.”

– MAJ(Dr) Jonathan Lim
Medical Officer

The medical team deployed in Gorkana as it was within reach of several mountainous villages. Rapid-Deployment Tents (RTDs) were set up and medical stores were put in place. The villagers also assisted by shifting furniture from schools into the tents. Local police helped regulate the huge number of people coming to receive aid.

A large portion of patients suffered from respiratory and gastrointestinal complications from excessive dust exposure and consumption of non-potable water.

“The smile of the villagers and the heartfelt gratitude they expressed told me what I did was right and meaningful. I am proud to be part of SAF, always vigilant and ready to respond in times of need.”

- ME2 Chong Xiang
Senior Medic

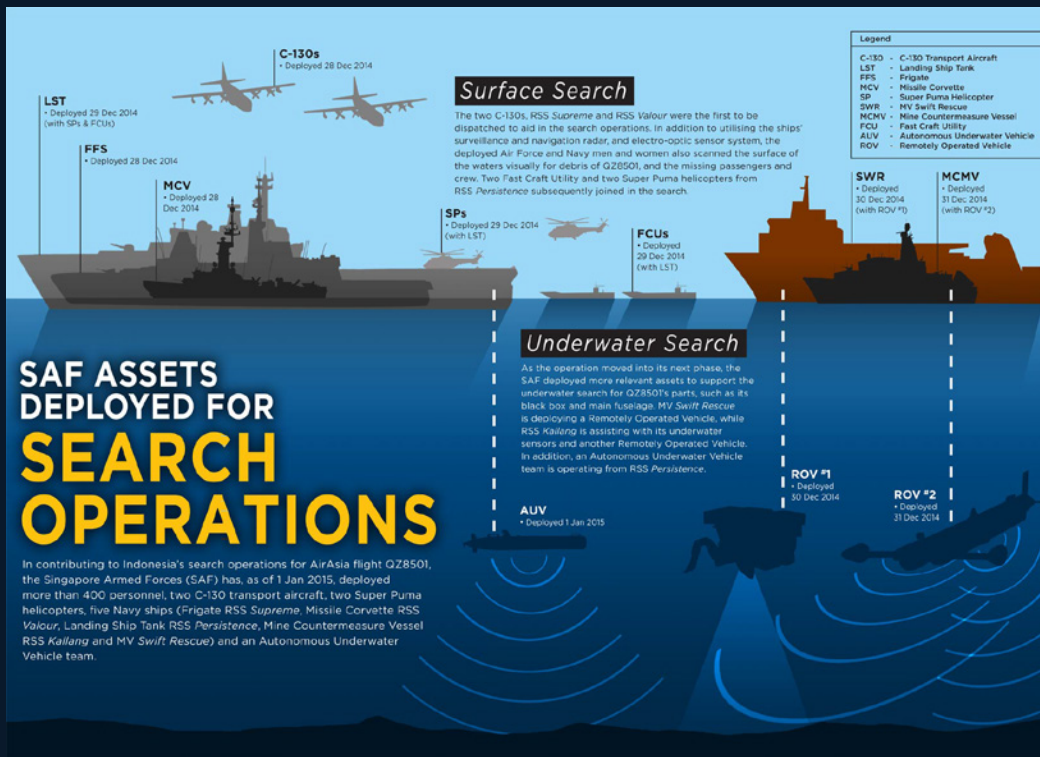


LTC(Dr) Adrian Tan comforting a worried child

After 12 days in Nepal, it was time for the medical team to return home. Before leaving, the team donated medical stores and equipment to the local clinic and bought toys and stationery for the schools in the vicinity.

The SAF Medical Logistics system works behind the scene to support all major SAF missions. These include providing Humanitarian Assistance and Disaster Relief (HADR) support to Taiwan earthquake in 1999, flooding in Nias Indonesia in 2001, tsunami in Indian Ocean in 2004, Java earthquake in 2006, Sumatra earthquake in 2011, Christchurch earthquake in 2011, Nepal earthquake in 2015 as well as peacekeeping missions to Timor Leste in 2003 and Afghanistan from 2007 – 2013.

AIR ASIA QZ 8501 SEARCH-AND-LOCATE OPERATION (2014)



On 28 December 2014, Air Asia Flight QZ 8501 was reported to be missing. A total of 162 people were on board. As part of the search-and-locate efforts, five ships and a 6-man Autonomous Underwater Vehicle team were deployed from the RSN into the middle of the Java Sea. The operation eventually ended with the discovery of a fuselage from the aircraft, which provided closure to the families of the passengers on board.

Navy Medical Service provided comprehensive medical support, with medical officers and medics deployed on every ship, including MV SWR. These medical teams braved bad sea states for the entire duration of 22 days, ever hoping for signs of life.

Adapted from *Asiaone*

AirAsia QZ8501: S'pore Navy ship finds body, life raft



© Jan 05, 2015 06:00 am

The crew on RSS *Persistence* followed up Saturday's haul of a luggage bag and part of an aircraft overhead compartment with the recovery of a body yesterday morning.

The body was sighted around 8am, and took about 45 minutes to recover.

It is unclear if the body is that of a male or a female as it was already wrapped up by the time reporters were granted access.

Four bodies were recovered yesterday - one by RSS *Persistence* and three by USS *Sampson* - taking the total number of bodies found to 34.



HANA: An aircraft life raft was spotted by RSS *Persistence* yesterday morning in the Java Sea. It could not yet be confirmed if the life raft was from AirAsia flight QZ8501. THE PHOTO: ARIFIN JAMAR

"Days turned into weeks and the uncertainty of the operation duration slowly took its toll on the crew. The highlight of the deployment was an unplanned mid-deployment port of call to Jakarta. Though short, this was a much-needed recess for the crew to escape the harsh conditions. Even though my ship didn't locate the fuselage, knowing that we were part of a massive multinational search, playing our part for a common goal, kept us motivated every day."

— CPT(NS)(Dr) Sim Wei Ping
Shipboard MO, RSS *Valour*

The Republic of Singapore Navy featured in The New Paper.

COMBATING TRANS-BOUNDARY HAZE IN THE REGION (2015)

As part of Singapore's effort to combat trans-boundary haze in the region, Singapore assisted her neighbours by deploying teams from SAF to combat forest fires through aerial forest firefighting. Twice in 2015, the SAF contributed CH47D Helicopters, supported by riggers from 3rd Transport Battalion and firefighters from the SCDF DART Team in these efforts to Chiang Mai, Thailand and Palembang, Indonesia. In each of these missions, the Air Force Medical Service (AFMS) deployed a medical team comprising one Aviation Medical Officer and one Aviation Military Medical Expert to provide primary and emergency healthcare, force medical protection and aeromedical support.

This was the first time that SAF had to deploy in areas with thick haze, where air quality hovered at a high of about 1000 PSI. The focus areas of the medical teams included management of haze-induced medical conditions (e.g. eye and respiratory) and provision of personal protective measures.



MAJ(Dr) Magdalene Lee and ME3 Patrick Low checking their medical equipment & drugs.

"I found great purpose and joy in helping the aircrew with their ops – such as assisting junior pilots with preparing the publications, aeronautical information and maps for the sorties. I was also given the opportunity to fly on lower-risk sorties to understand their operating environment. This was a good opportunity for me to not just forge a tribe with fellow airmen, but also learn first-hand about their working environment."

- MAJ(Dr) Jonathan Kwong
Aviation Medical Officer

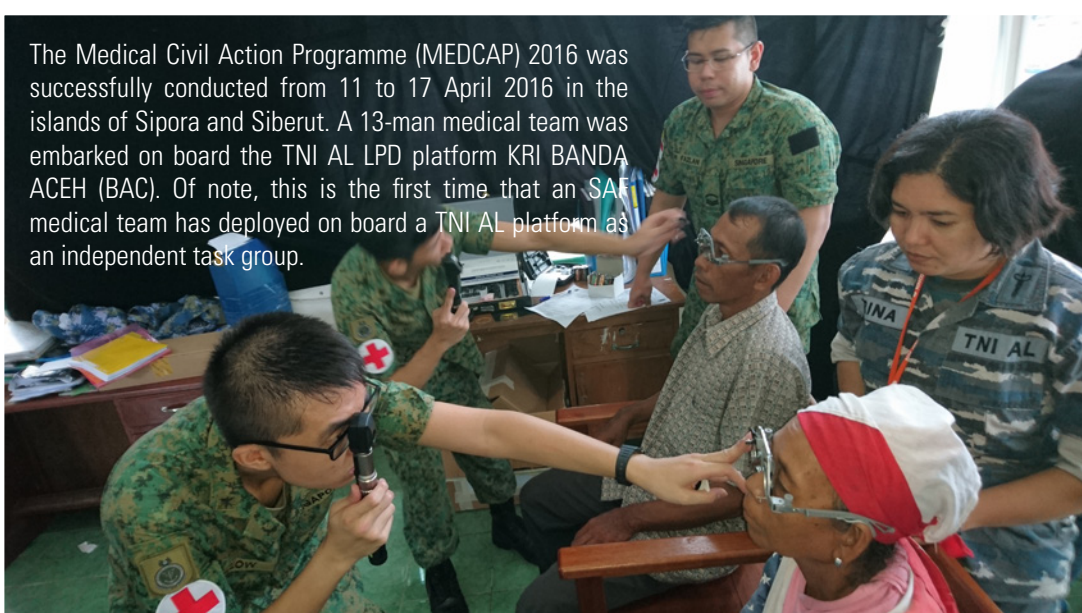
The mission projected the SAF's professionalism and high readiness posture. The RSAF medical teams were well-regarded by their medical counterparts in Thailand and Indonesia, who remarked that they were swift in their deployment and while in-theatre, were ready to prosecute the mission. It also allowed the RSAF to forge strong bonds of friendship with the Royal Thai Armed Forces and Indonesian National Armed Forces (TNI) as RSAF's airmen worked alongside them to fight the forest fires.

"I experienced first-hand the dynamism and pace of ops, and how we had to be adaptable and prepared. Like most OOTW, we were prepared for a VUCA environment, and could depend on the robust training SAF had equipped us with and the experience of past deployments to fulfil the raison d'être of this mission. The refinement of plans was done dynamically in-theatre, whilst executing the operations on the ground."

- MAJ(Dr) Magdalene Lee
Aviation Medical Officer

INTERNATIONAL FLEET REVIEW MEDICAL CIVIC ACTION PROGRAMME (2016) - SOCIOCIVIC MISSION TO PEOPLE OF KOMODO ISLAND

The Medical Civil Action Programme (MEDCAP) 2016 was successfully conducted from 11 to 17 April 2016 in the islands of Sipora and Siberut. A 13-man medical team was embarked on board the TNI AL LPD platform KRI BANDA ACEH (BAC). Of note, this is the first time that an SAF medical team has deployed on board a TNI AL platform as an independent task group.



“As the medical team flew to the Komodo islands via air while the medical stores were delivered by our ship, there were challenges coordinating the delivery of medical stores to KRI BANDA ACEH.”

– **ME2 Tan Yun Xiang**
Senior Medic

Led by Mission Leader LTC(Dr) David Law, along with Ophthalmology team leader SLTC(Dr) Tan Chiang Lee Marcus as well as Dental team leader CPT(NS)(Dr) Seah Tian Ee, the niche medical capabilities provided by RSN were very well received. The Ophthalmology team treated over 300 out of the total 1000 MEDCAP patients and prescribed 274 pairs of glasses over 3 days. The dental team also performed 36 dental extractions, 3 minor dental surgeries and assisted the TNI AL in more complex procedures.



*An oral surgical procedure
being performed on a patient.*

CONTRIBUTING TO MULTINATIONAL COALITION EFFORTS AGAINST TERRORISM (2017)



In November 2014, Minister for Defence Dr Ng Eng Hen announced that the SAF would be supporting the multinational coalition efforts against the extremist threats posed by the Islamic State in Iraq and Syria (ISIS). Since then, the SAF has deployed planners, liaison officers, intelligence fusion officers, imagery analysis teams, and Republic of Singapore Air Force KC-135R tanker aircraft.

Additionally, since June 2017, the SAF also deployed medical teams to Iraq to further support the coalition forces in their fight against ISIS, working closely with their counterparts from the Australian Defence Force and the New Zealand Defence Force.

Team cohesiveness is very important. You need to depend on and work with each other as we will be relatively isolated from home. No man is an island and no man can accomplish anything just by himself"

- ME2 Jeremy Chan

During a visit made by Dr Ng on 26 September 2017, the SAF medical team demonstrated their medical capabilities as well as their close working relations with their allied coalition partners. Dr Ng also met with other coalition commanders from Australia and New Zealand, where they expressed their appreciation for Singapore's contributions towards the counter-terrorism efforts in Iraq.

"I received my first Father's Day card handwritten by my 2 year old son with his palm print on it. My wife had also sent all the goodies (like my fav Bak Kwa) which I love together with the card. I felt emotional and at the same time lucky that my loved ones are thinking of me and felt rejuvenated to face the remaining days there"

- ME4 Jiva Ananthan

SAF's contribution to the coalition efforts is a strong indicator of Singapore's willingness and capability to support multi-national efforts to react to and neutralise the threat of terrorism. Terrorism affects the lives of countless civilians. By contributing to the coalition forces, Singapore is doing its part to help address the terrorist threat at its roots.

"I always learnt to appreciate the peace and security that I enjoy in Singapore. Though we are not perfect, there is much to appreciate and be thankful for. Whenever I don my body armour and ready my weapon in preparation to go out, I am reminded that in Singapore, we head out at night without a second thought. That is how safe Singapore is.

I have seen first-hand how decades of war and unrest have destroyed their peace, their society and their way of life. We, in Singapore, cannot and must not allow this to happen to us."

- LTC(Dr) Adrian Tan

Medical Team Commander, Rotation 1

MEDICAL OPERATIONS THEN & NOW

As early as 1970, just three years after the formation of the SAF Medical Services, our people were activated to respond to calls for help from East Pakistan. Being the SAF's first Humanitarian Assistance and Disaster Relief (HADR) mission, our medical pioneers had to establish new protocols and make do with whatever equipment they had. It was through pure heart and grit that the Medical Team, led by then CPT(Dr) Seet Lip Chai, pulled through this arduous operation.

Over the next 50 years, the SAF Medical Corps would respond to more than 20 Peace Support and HADR operations. Even as the SAF Medical Corps celebrates its 50th anniversary in 2017, Medical Teams are being deployed in Iraq as part of the multinational coalition force against ISIS. When we include socio-civic missions to this list, the SAF Medical Corps would have supported more than 50 operations or an average of one operation per year - hence the moniker of being one of the most operationally ready Formations of the SAF!

As we look back the last 50 years of operations, it is undeniable that the mission profiles have increased in complexity. Beyond providing Level 1 medical capabilities in the early HADR years, we have progressed to be able to also deploy Level 2 medical

capabilities at short notice. This is in tandem with the progress of many countries building their organic capabilities for disaster management. Together with the Changi Regional HADR Coordination Centre (RHCC) launched in 2014, the SAF is now equipped with a comprehensive monitoring, assessment, coordination and response capability to a disaster.

The advent of IT technology also affords us ready access to essential information that directly impacts our planning, including pre-deployment force medical protection measures to the types of medical specialties and capabilities that are needed in the disaster area. Supply chain management has also improved with the modularisation of medical logistics on an indent basis.

The world is more inter-connected than ever. To remain relevant, Singapore needs to become an even more active and trusted member of the international community. We stand ready to assist our neighbours, near and far, should the need arises. The present threat of terrorism is transboundary and global, with terrorist groups based overseas posing a direct threat to Singapore and Singaporeans. The SAF Medical Corps must sharpen our capability to respond to these challenges, both overseas and locally. For we will be called upon - not if, but when.



"The SAF Medical Corps is in a unique position. We provide military medical capabilities that are much needed in Counter Terrorism, Peace Support and HADR Operations. These same capabilities are also deployed in large-scale national events such as NDPs and SEA Games. Medical operations hearken to the very core values of the SAF Medical Corps. Where there is suffering, we bring relief. Where there is despair, we bring hope. Through these 50 years and beyond, we stand by our values to Seek Excellence, Save Lives, and Serve the SAF".

- COL Ng Hock Sing

Senior Medical Staff Officer (2012 – Present)

Commander Kabul Team 6, Ops Blue Ridge, Afghanistan 2012

“Constantly think out of the box and do not be afraid to make mistakes. Always think about the needs of the operators on the ground as the work that is done needs to be applicable and not just sound good on paper.”

- SLTC(Dr) Wong Sheau Hwa
Deputy Chief Airforce Medical Officer
Hd Aeromedical Centre

TO SEEK
AND SAVE
AND SERVE



MILITARY MEDICINE IN THE SAF

Military medicine is a crucial component of the overall medical support for the Singapore Armed Forces. The development and advancement of Military Medicine over the past 50 years has significantly enhanced the performance and extended the operational envelope of our combatants.

Be it in the underwater domain, aviation environment or army terrain, there are fundamental differences in each operating environment. Military Psychiatry, Vision Performance, Military Sports Medicine, Aviation Medicine, Underwater Medicine, Forensic Dentistry, and Biodefence are therefore highly relevant to the SAF and sharpen the fighting edge of our combatants.



To support the needs of a fledgling Navy and Airforce, the SAF pioneered the development of Diving and Hyperbaric Medicine as well as Aviation Medicine in Singapore in 1968. With the evolution of operational medical support over the decades, niche Military Medicine specialties such as Forensic Dentistry, Vision Performance, Military Psychiatry and Military Sports Medicine were developed to further optimise manpower resources and enhance human performance.

The SAF has since successfully established Centres of Excellence (CoE) which include Aeromedical Centre (ARMC), Naval Underwater Medicine Centre (NUMC), Centre of Excellence for Soldier Performance (CESP), Psychological Care Centre (PCC), Specialist Dental Centre (SDC), Vision Performance Centre (VPC) and Biodefence Centre (BDFC). These CoE play an important role not only in the SAF but also at the National and Regional level.



VISION PERFORMANCE: PERFECTING VISION FOR MISSION SUCCESS

In Singapore, 3 out of 4 people are short-sighted, which is one of the highest rates worldwide. In the SAF, pilots, naval divers, commandoes and other critical vocationalists require near-perfect or perfect eyesight.



SAF Optometrist conducting eye screening in VPC

The Vision Performance Centre (VPC) strives to improve the vision performance of regular servicemen and DXOs in the SAF. Regulars and DXOs can have their vision checked at the Vision Care Clinic in VPC and those who require contact lenses or spectacles can have them made at the clinic. This helps to attract and keep talent in the military in spite of the servicemen's short-sightedness or long-sightedness.

VPC also offers assessments to Regulars & DXOs seeking Refractive Eye Surgery and refers them, if needed, to partner institutions such as the National University Hospital for surgery under its Vision Care Programme. The VPC clinic also conducts comprehensive eye checks for SAF personnel and screens them for specific eye conditions that may have an impact on their vocation. VPC also conducts a wide range of vision performance projects. The research findings have been published and presented at national and international ophthalmology conferences, further highlighting the deep expertise of military ophthalmology in the SAF.



SUPPORTING SAF PILOTS, DIVERS, COMMANDOES AND OTHER ELITE FORCES

Fighter pilots need good eyesight as spotting the enemy first in aerial battles mean survival and victory. Also, good eyesight aids the pilot's ability to withstand gravitational pull and to think swiftly under pressure. Corneal Refractive Surgery improves peripheral vision and enables pilots to see more clearly from the corner of their eyes as well, further enhancing situational awareness.

Good vision also enhances the ability of divers and submariners to perform their roles. Divers require clear vision to undertake missions underwater. It is also not feasible for them to wear contact lenses in an operational setting due to risks of infection or dislodgement. Submariners, especially the Officers-On-Watch, are required to peer through the periscope at depth to observe activities on the surface of the sea. Being able to look through the

periscope lens without spectacles is less straining especially during long hours of watch-keeping.

Corneal Refractive Surgery is also available for other elite forces who are required to perform activities for which wearing corrective lenses are inhibitive. These include military freefall, close quarter combat and operations in austere environments.

THE NEXT BOUND

Currently, the VPC is involved in research projects that focus on rectifying vision through the use of new technology. This includes research on new implantable lenses, next-generation laser surgeries and adoption of more durable contact lenses that are suitable for field use.

*LTC(Dr) Bryan Ang
presenting at the
Military Refractive Surgery
Symposium 2017*

MILITARY PSYCHIATRY: ADVOCATING MENTAL HEALTHCARE



An SAF psychologist conducting group Dialectical Behaviour Therapy (DBT).

Almost all soldiers would concede that military life brings about just as many mental challenges as well as physical ones. The journey to become a strong soldier involves blood, sweat and tears. Consequently, there is a pressing need for the development of military psychiatry in the SAF to help soldiers overcome mental hurdles that they might face in adjusting to military life. After all, a well-adjusted soldier is also an effective one!

Certain individuals may have pre-existing mental health problems at the point of enlistment which require special attention. Psychological issues may also arise in healthy enlistees who are thrust into an unfamiliar military environment. Hence, the role of SAF psychiatrists involves not only treatment, but prevention and optimisation as well. The approach that psychiatrists in the SAF take requires a sharp focus on the clinical well-being of the soldier and meticulous policy development. This requires military psychiatrists to be familiar with the environment within the SAF and be able to apply this knowledge within the context of psychiatric practice.



Psychiatry is the branch of medicine that aims to diagnose, treat and prevent mental, emotional and behavioural disorders. The mental health issues that arise in military environments differ greatly from those that arise in civilian environments. Military psychiatry hence seeks to apply psychiatry in the unique context of a military environment.



Psychological Care Centre Ward at Institute of Mental Health.

SAF PSYCHOLOGICAL CARE CENTRE (PCC)

PCC plays an important role in this overarching aim of Treatment, Prevention and Optimisation. PCC operates a psychological medicine outpatient and inpatient centre, which handles cases ranging from temporary adjustment difficulties to full-blown psychiatric conditions like depression and psychosis. Unique to the military context, the psychological care provided at the PCC often involves close communication with commanders from the soldier's unit. This allows the military psychiatrist and psychologist to understand the patient's in-camp situation and inform the patient's superiors about the nature of the condition and its potential effects on the soldier's performance. The military psychiatrist can also discuss with the commanders on the best way to manage the soldier to enable him to return to his duties.

MANAGEMENT OF MENTAL HEALTH CONDITIONS ARISING FROM WAR

The psychological issues that psychiatrists in the SAF have to address may go beyond adjustment difficulties. It is a well-known fact that war takes a huge psychological toll on soldiers, especially those who are unfortunate enough to witness the carnage that happens on the frontline. Given the existence of such unique situations in the military, there is a need for robust protocols for incident management, screening and follow-up. This further underscores the need for military psychiatrists who are keenly familiar with the military context and are able to use evidence-based approaches to treat psychological issues arising from war.


*Background picture:
SAF Psychiatrist LTC (Dr) Robin Goh
in a clinical consultation.*

Increasing attention has also been paid to the unique psychological needs of pilots, aircrew and sailors. The aviation psychologists assist in enhancing aviation safety through building up of knowledge and understanding human factors and safety management systems. They also conduct flying training support programs and routine interviews to ensure the well-being of RSAF trainees and personnel. Navy psychologists also conduct regular psychological and cadence studies to assess and enhance mental resilience in the sailors.

WAY AHEAD

The Military Psychiatry curriculum will be extended to Lee Kong Chian School of Medicine and Duke-NUS Medical School to expose local medical students to the unique challenges arising from military life. In addition, with a sufficient number of trained military psychiatrists, there is potential in the future for a Section of Military Psychiatry to be formed under the College of Psychiatrists in the Academy of Medicine.

*Background picture bottom:
Ms Bernice Goh, an Aviation Psychologist, on
board the PC-21 prior to her familiarisation
flight, at 130 SQN, Perth, Australia.*



The Aviation Psychology Branch (APB) within the Aeromedical Centre (ARMC) was set up in the 1980s to administer psychological assessment for selection of pilots. From the pencil-and-paper tests in the 1980s, the process has evolved into a fully computerised system (COMPASS@RSAF) that selects candidates for a wide range of RSAF vocations. In addition, Aviation Psychologists also sit on the Weapon Systems Officer (Fighter) Selection Board to help evaluate the personalities and motivations of potential candidates.

MILITARY SPORTS MEDICINE: OPTIMISING SOLDIER PERFORMANCE

Military Sports Medicine focuses on the management of our soldiers holistically as a soldier system. The soldier system is designed to prevent injuries and accelerate the recovery of soldiers so that they are still able to 'stay in the game' and continue to train and deploy. This is particularly important in the SAF because of the strenuous training and high physical demands on the soldier.

PREVENTION AND MANAGEMENT OF MUSCULOSKELETAL INJURY

Over the years, Soldier Performance Centre (SPC) has developed comprehensive physiotherapy services to support the soldiers, airmen and sailors. SPC has built deep expertise in the areas of injury management and functional rehabilitation in the military. Beyond the confines of brick-and-mortar clinics, the Rehab@Unit initiative involves the deployment of therapists and exercise scientists on the ground with manoeuvre units. This has helped improve access to rehabilitation services and ensure compliance with outpatient exercise regimens for soldiers with musculoskeletal injuries. Looking ahead, with a greater understanding in Sports sciences, the Centre of Excellence in Soldier Performance (CESP) will adopt the latest medical evidence to improve pre-rehabilitation, training and rehabilitation programmes. The pre-rehabilitation programme will reduce the incidence and severity of musculoskeletal injuries in our soldiers.



Physiotherapy assessment and consultation



Chief of Army observing a demonstration of an ankle pre-rehab programme activity.



PREVENTION AND MANAGEMENT OF HEAT INJURY

One perennial challenge of conducting tough military training in the tropics is the problem of heat injuries which can be fatal. SPC has worked closely with the defence-science industry partners and educational institutes to develop and implement preventive measures and enhance human performance. Improvement in hydration and acclimatisation protocols, environmental heat stress monitoring protocols and optimisation of work-rest cycles are all products of the close collaboration between military medicine, training and research communities. SPC also lent its expertise to work with Ministry of Health to jointly develop the national guidelines on the management of heat injuries.

Other key developments to prevent heat injury include the evolution of the SAF uniform over the years. The new fabric from the new uniform is highly permeable and water-absorbent, enabling better air flow and greater heat dissipation. It also dries faster at double the rate of the old uniform.

TACKLING OBESITY AND INCREASING PHYSICAL ACTIVITY

The SAF actively manages obese recruits by enlisting them directly to a 19-week weight loss programme. Obese BMT recruits regularly achieve 15-20kg of weight loss on average. Today, efforts are focused at preventing weight gain and maximising physical performance in the NS population after ORD. We have, at our disposal, levers such as sports, training and nutritional policies and programmes. Our future sights are focused on reducing the impact of sedentary lifestyles in our NS population.

TECHNOLOGICAL ADVANCEMENTS

One exciting area to watch will be the adoption of wearable technologies during training. In their most basic form, wearables can



serve as fitness trackers to help our soldiers maintain a personal training log to chart training progress. On a day-to-day basis, commanders can also use the wearables to track the performance of the soldiers and prescribe the intensity and duration of exercises for the individual soldier. The proverbial 'holy grail' will be to develop a wearable tracking system which can help predict and identify soldiers at risk of heat injury and measure soldier fitness and training outcomes. Looking at how far we have advanced over the years, it is important to acknowledge that the era of 'low hanging fruits' has passed. Targeted approach to enhance health and fitness in a holistic manner will significantly improve the soldier system.



NAVAL MEDICINE: OVERCOMING THE PRESSURE AND HIGH SEAS

Naval Medicine encompasses Underwater Medicine and Naval Operational Medicine. The Naval Underwater Medicine Centre oversees 3 specialised areas namely: Diving Medicine, Hyperbaric Medicine and Submarine Medicine.

DIVING MEDICINE

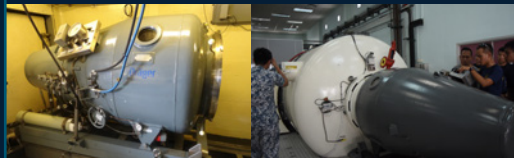
The Diving Medicine Section (DMS) oversees the development of dive screening policies as well as conduct of diver and submariner screening for the SAF. Diver and Submarine Medical boards are also convened to review and manage the medical conditions of divers and submariners so as to optimise their fitness for the onerous environment that they are exposed to.

HYPERBARIC MEDICINE

The Naval Hyperbaric Centre (NHC) is home to 3 hyperbaric chambers: a COMEX chamber, a Japanese chamber and a British chamber. The different capabilities of the chambers enable Naval Hyperbaric Centre to conduct close to 200 chamber dives annually, inclusive of treatment of divers stricken with decompression sickness (DCS). The NHC is also a training site for Dive Supervisors, Hyperbaric Technicians as well as Naval Military Medical Experts to develop their skills in hyperbaric chamber operations. The NHC workflow processes and chamber management are benchmarked against industry standards. NHC was awarded the Undersea and Hyperbaric Medicine Society (UHMS) Chamber accreditation in 2017.

Out at sea, the Super DuoCom chambers on board the Mine Counter-Measure Vessel (MCMV) provide on-site diving support with Transfer-Under-Pressure (TUP) Capability.

The Transfer-Under-Pressure (or TUP) capability allows Dive Supervisors to commence treatment out at sea. Upon return to base, the Super DuoCom chamber can be mated with the chambers in Naval Hyperbaric Centre which allows treatment to continue from sea to land without interruption!



Left: The SuperDuoCom chamber can treat one casualty in the presence of a chamber attendant. Right: Mating of the Super DuoCom chamber with the Japanese Chamber.



ME3 Joseph Tan briefing ExPACREACH 16 delegates on the RSN SUBSAFE capability.



Submariners are also required to undergo dive screening to ensure fitness for Submarine Escape Training. This involves a rapid ascent from depth through a tall column of water which simulates an escape from a distressed submarine. The large pressure changes during ascent carries with it a risk of injury to the ears, sinuses and lungs.

SUBMARINE MEDICINE

Submarine Medicine looks at how to optimise the working conditions on board the submarines and enhance the occupational health of the submariners. A significant proportion of time is spent drilling the hyperbaric medical team in submarine rescue procedures. This is essential to maintain operational readiness of the RSN submarine rescue capabilities to respond to submarine incidents. The dedicated Submarine Escape and Rescue (SMER) medical capability on MV Swift Rescue (SWR) provides round-the-clock standby not only for RSN but also for regional navies. This platform houses a multi-place recompression chamber complex (RCC) and medical facility capable of managing a wide range of light to severe casualties with decompression sickness and other injuries. NMS also promotes medical professional learning and cooperation with partner navies through the larger regional Submarine Rescue Support Network. Through participation in multilateral exercises such as Ex Pacific Reach, the RSN has been able to enhance interoperability between the navies in the area of submarine rescue operations. This has positioned Singapore to become an important regional submarine rescue hub, which will enhance the survivability of casualties in a distressed submarine.



The Recompression Chamber Complex on board MV SWR has specially positioned chamber locks to facilitate the transfer of casualties and chamber attendants between compartments, which may be at different hyperbaric chamber pressures.



NAVAL OPERATIONAL MEDICINE

NMS provides frontline naval operational medical support through the Maritime Integrated Medical Evacuation System (MIMES). MIMES is an integrated system comprising different types of medical assets on various RSN ships and is supported by both air and sea evacuation assets. This is to ensure that casualties can be stabilised, treated and evacuated expediently to the next higher echelon of medical care.

Apart from the organic Shipboard Medical Team, which is made up of a medical officer and medics, selected ship crew are trained in advanced first aid and trauma management. The RSN Independent Duty Corpsmen (IDC) also provide advanced trauma and cardiac life support in the absence of medical officers on RSN ships and submarines. The large pool of National Service reserves has also been a key enabler for NMS to be able to provide comprehensive maritime medical support to meet the RSN's operational requirements.

OVERCOMING CHALLENGES THROUGH INNOVATION

Over the years, RSN has developed innovative solutions to overcome the challenges of providing medical support in a confined shipboard environment.

RAPIDLY DEPLOYABLE MARITIME CONTAINER

The Rapidly Deployable Maritime Container (RDMC) is the most recent addition to the RSN's range of specialised medical modules. The RDMC is a ISO-standard container, which can be expanded to three times its size. It is cross-deployable across a wide

range of RSN ships, Civil Resource vessels and vessels from other navies. This provides additional operational flexibility in deployment of the RDMC for different types of operations. The RDMC can be fully integrated with the ship's electrical, freshwater and blackwater sewage system which enables the RDMC to operate continuously for prolonged durations out at sea. It also incorporates hospital-grade features such as a laminar airflow and HEPA air-filtration system, which reduce the risk of infection and enhance patient safety.



Cross-deployability of the RDMC on board the Landing Ship Tank, Civil Resource vessel, USN Transport Craft as well as the newly commissioned Littoral Mission Vessel RSS INDEPENDENCE

RETROFITTING THE FRIGATE DINING ROOM



Intensive Care Unit in the retrofitted Frigate Dining room

In order to optimise space on the Frigate, the dining room can be rapidly converted into an Intensive Care Unit (ICU). The dining tables are converted into hospital beds, and shelves are attached to bulkheads to secure life-support medical

equipment, which can withstand high sea states. The organic shipboard Medical Centre and ICU are also installed with LED lights to provide adequate illumination for medical and surgical procedures. These innovative solutions have expanded the mission profile of the frigates. Retrofitting of the Landing Ship Tank (LST) also enables the LST to scale up from just one Operating Theatre (OT) in the existing organic medical centre up to three OTs, which includes the add-on RDMC module, and conversion of the existing Briefing room to an OT.

STAYING AHEAD OF THE CURVE

Moving ahead, NMS will be supporting the development of the RSN's new 218SG submarines, which will include the design of the organic medical support spaces and requirements within the submarine. As MV SWR approaches its 10th year of operations, the recompression chamber complex and medical facility on board MV SVR will also be undergoing an upgrade to support the evolving needs of the submarine squadron. To further enhance support for a Deployed Navy, new fatigue management strategies will be implemented to optimise sailor performance and mental resilience of our naval warfighters.

AVIATION MEDICINE: REACHING FAR AND HIGH

The RSAF deploys her assets in our skies daily and has pilots and aircrew working 24/7. In order to ensure that pilots and aircrews are in their best form to perform their roles, Aviation Medicine comes into the scene. This specialty strives to treat and prevent conditions to which aircrew are susceptible to and applies medical knowledge of human physiology into aviation operations.

AVIATION PHYSIOLOGY TRAINING

Aircrew and aviation personnel undergo aviation physiology education to teach them about the high altitude aviation environment and its effects on the human body. Practical training is also conducted to simulate the stresses that aircrew may experience while operating in the dynamic flight environment.

Aviation physiology training is carried out using the Human Centrifuge, Turntable, Hypobaric Chamber, Ejection Seat, Disorientation, and Night Vision trainers.

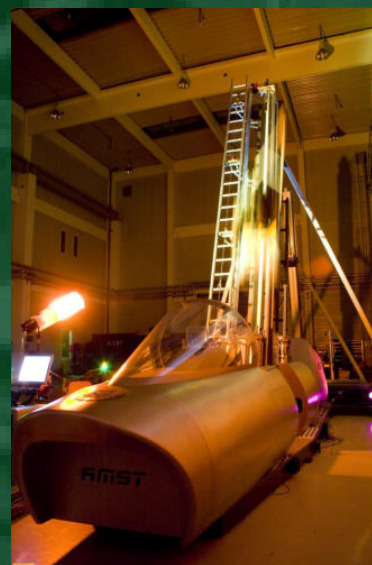
PERFORMANCE MAXIMISATION

In 2001, Air Force Medical Service (AFMS) set up the multi-disciplinary Performance Maximisation Branch (PMAX) comprising specially trained aviation Medical Officers and psychologists. The PMAX branch continually hunts for cutting edge medical technology and psychological research and translates the ideas for RSAF's operational use. The goal is to push RSAF's operational envelope in the area of human performance and use medicine and psychology as force multipliers. The key thrusts are fatigue management, psychological enhancement and cognitive enhancement.

In modern aviation, the capability to fly longer hours, mount continuous night-time operations and rapidly project large forces over multiple time zones offer the Air Force strategic advantages that push the human fatigue limits. AFMS adopts a three-pronged approach for fatigue management, namely Prevention, Detection, and Intervention. Over the past 16 years, PMAX has developed comprehensive



The Hypobaric Chamber simulates the low atmospheric pressure environment found at elevated altitudes up to 80,000ft. It allows aircrew to experience the effects of rapid decompression of an aircraft, effects of hypoxia and breathing in of rarefied air.



The Ejection Seat Trainer teaches aircrew the proper techniques for safe ejection from a stricken aircraft, so that they will have the best odds of escaping from a damaged aircraft with minimal injury.

management strategies for each approach based on the latest evidence in fatigue management. The first aspect of prevention looks at fatigue and sleep hygiene education. A fatigue modelling tool can be used to plan deployment schedules for operations that cross multiple time zones as well as flying operations that take place in the early morning. The second aspect of detection focuses on conduct of research in physiological, cognitive and subjective measures of fatigue with the aim to detect fatigue earlier and better. The last aspect of intervention comes into play when prevention and detection strategies are insufficient. It involves use of non-pharmacological tools such as blue-enriched white light (which enhances alertness), and pharmacological measures to assist in a more restful sleep during odd daytime hours or to temporarily enhance alertness past the crew's normal effective working hours.

The road ahead for fatigue management is to harness technological advances to strengthen these three areas. For example, computerised eye tracking can be used to detect fatigue real time, and interventions can be incorporated into wearable devices to improve alertness during flight.

AEROMEDICAL EVACUATION (AME)

To enable realistic, rigorous and demanding training to be carried out, a large number of SAF personnel are deployed far and wide across the globe to achieve the dual purpose of achieving training excellence and strengthening defence relations. For these servicemen, servicewomen, and their families, the RSAF and the AFMS stands ready to bring them back to Singapore should the need arise due to injury or sickness.



Practical sessions during the RSAF Aeromedical Evacuation Course held in Feb 2017



Managing a simulated casualty on board the C130

Aeromedical Evacuation (AME) on board fixed-wing aircraft enables expedient transfer of casualties over long distances. On-board the aircraft, personnel are trained in intensive care and are able to utilise the medical equipment to resuscitate, stabilise and sustain the lives of critically ill individual inflight.

HELIBORNE MEDICAL EVACUATION (HEME)

Heliborne Medical Evacuation is one of the key modes of evacuation of severely injured casualties. 1MS HEME teams fulfil the link between field surgical units and tertiary hospitals, where definitive surgeries and treatment can be carried out.

Currently, HEME missions are carried out on board Super Pumas and Chinooks. The ability to use rotary wing platforms provides the HEME teams with significant advantages, as long runways are not required for the landing of aircrafts. Instead, HEME teams can reach field surgical units easily, given that the helicopters only require a landing pad to land and allow for enplaning of casualties.



Interior of the Transport Isolation System (TIS).



3rd Generation Ambulatory Mobile Life Support Unit.

temperature conditions within the aircraft. Due to the urgent nature of such operations, night flights can also be expected. Imagine setting a chest tube on board a helicopter with limited vision at best!

HEME missions are carried out by a 2-man team comprising one Medical Officer (MO) and one medic. The team is trained to perform various interventions such as endotracheal intubation, advanced cardiac life support and connection of the casualties to the patient monitor and ventilator. In addition to the space constraints, the rotary wing environment also poses a significant challenge to the HEME team. Not only is verbal communication virtually impossible due to noise from the engine and rotors, HEME teams must also operate under suboptimal



WHAT'S THE DIFFERENCE?

	Search & Rescue / SAR	HEME	AME
Patient Profile	Military & civilian; Less critically ill	Military; Critically ill requiring ICU-level care	Military & civilian; Up to critically ill
Platform	Rotary wing	Rotary wing	Fixed wing
Flight Distance	Short-long distances	Short-long distances	Very long distances
Equipping	Less sophisticated	More sophisticated ICU-level equipment e.g. Monitoring, Oxygenation, Ventilation & External Suction (MOVES) device.	More sophisticated ICU-level equipment

FORENSIC DENTISTRY: LOOKING INTO DEAD PEOPLE'S MOUTHS

Forensic Dentistry (FD) is a unique subspecialty of dentistry which involves the examination and evaluation of dental evidence to resolve issues of identity. This includes the identification of unknown human remains during Disaster Victim Identification (DVI), examination and assessment of injuries resembling bite marks as well as facial injuries following trauma or assault and age estimation of both living and deceased persons. This capability is of particular relevance to the SAF both in times of war and conflict, as well as during civil emergencies in peacetime.

The main application of Forensic Dentistry in a military setting concerns the identification of unknown human remains, although the other areas are also applicable in certain circumstances. For example, an inmate in Detention Barracks who claims that he was bitten by a Military Policeman (or could it be that the bite was actually self-inflicted?). A Forensic Odontologist may be able to exclude and also identify the suspect.

The first recorded use of forensic dental identification was in AD 44-69 when Agrippina (wife no.4 of Emperor Claudius & Nero's mother) ordered her rival to be killed. In order to verify that the deed had been carried out, Agrippina required the assassin to show her the head of the deceased and she was identified by her discoloured tooth.

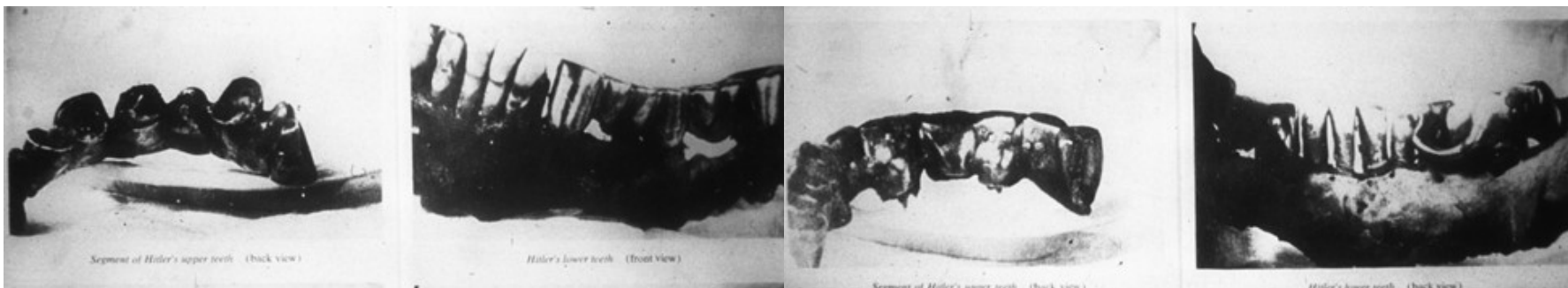


FORENSIC IDENTIFICATION

Methods of forensic identification must be scientifically sound, reliable, applicable under field conditions, and capable of being implemented within a reasonable period of time. The International Police Organization (INTERPOL) recognises comparative dental analysis as one of the three scientifically reliable primary means of forensic identification. The other two methods are fingerprint and DNA analysis. Each primary identifier can stand alone as the sole evidence to make a positive identification.

Secondary methods of identification include personal description (e.g. tattoos), belongings (e.g. jewelry) and medical findings (e.g. scars from previous operations). These means of identification serve to support primary identification methods and are not sufficient on their own as a sole means of identification.

In World War II, the Russians being the first to enter Berlin had brought the body of Adolf Hitler (who had committed suicide in his underground bunker) back to Russia. The dentures found on what was thought to be the Fuhrer's cadaver were shown to the dental technician who had made them, and in so doing the Russians were able to identify Hitler's remains.



FORENSIC DENTISTRY IN THE SAF

In recognition of the need to develop FD in the SAF, SAF sent then CPT(Dr) Tan Peng Hui to Melbourne, Australia in 1993, to pursue his postgraduate speciality training in FD, making him Singapore's pioneer Forensic Odontologist. In 2014, a 2nd Forensic Odontologist, then CPT(Dr) Gabriel Chong completed his postgraduate training at Dundee, United Kingdom. Till date, the SAF remains the only public institution in Singapore to have raised Forensic Odontologists. The SAF Forensic Odontologists have since then not only served the SAF but the nation as well. The latter includes, for example, contributing to the development of the nation's Disaster Victim Identification (DVI) capabilities and plans.

The SAF Forensic Odontologists are also regularly deployed in HADR missions to provide DVI support. These missions include DVI support for the Silk Air Flight MI 185 Crash in 1997 in Palembang, Indonesia, the 2004 Boxing Day Tsunami in Phuket, Thailand, the Christchurch Earthquake in 2011 in New Zealand, the AirAsia QZ8501 crash in 2015 in Surabaya, Indonesia and the Nepal earthquake in 2015. As arduous as it might be and given different cultural, environmental and technical challenges, the DVI team brings closure for the families of victims.



Then MAJ(Dr) Tan Peng Hui examining the first human dental remains to arrive at the mortuary in Palembang Airport



WAY AHEAD FOR FORENSIC DENTISTRY

By advancing and strengthening its expertise in this niche area, it is hoped that the SAF Medical Corps will eventually be recognised as the regional leader in Forensic Dentistry. It is envisioned that in times of peace, the SAF Medical Corps will continue to offer essential forensic dental training and expertise and in times of need, continue to contribute Forensic odontological expertise to the SAF and the nation.



The first major mass Disaster Victim Identification utilising dental expertise was in the aftermath of a fire in the Bazar de la Charite, Paris, 1897. A total of 126 lives were lost and most of the victims were ladies from aristocratic backgrounds. This event prompted a certain Dr Oscar Amoëdo Y Valdes (later known as the father of Forensic Odontology) to write a textbook *L'Art Dentarie en Medicine Legale* (The Dental Art in Legal Medicine) which served as the authoritative textbook in the field for a long time.

BIODEFENCE: SAFEGUARDING OUR SERVICEMEN AGAINST BIOLOGICAL THREATS

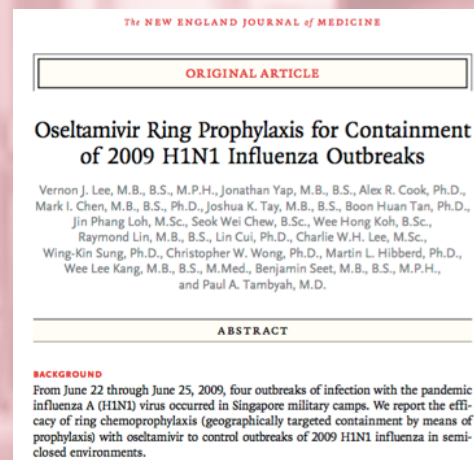
Infectious diseases are an ever-present threat in our globalised world, manifested in the rapidity at which global pandemics spread across international boundaries. Novel pathogens such as SARS, novel influenza, or Ebola virus can emerge at any moment as a result of the dense animal-human-environment matrix that characterises industrialisation and urbanisation. SAF servicemen are vulnerable to these threats in their numerous overseas deployments to both rural and urban areas. Infectious diseases can also spread rapidly within close quarters such as military barracks, resulting in large outbreaks that cause significant manpower downtime, compromising training tempo and operational readiness. The Biodefence Centre (BDFC) was established to address biodefence, infectious diseases, and environmental public health issues pertinent to the SAF.

OUTBREAK RESPONSE

BDFC is on 24/7 standby to respond to any outbreaks within the SAF. These outbreaks range from common diseases such as gastro-intestinal disease (GID) and conjunctivitis to more serious diseases like meningitis, leptospirosis, and tuberculosis. BDFC's outbreak response plan is structured along the five-pronged Biodefence Framework: Early Warning, Protection, Detection and Diagnosis, Containment, and Recovery. BDFC also leverages on the expertise of key strategic partners, including the Centre of Infectious Disease Epidemiology and Research (CIDER). One of BDFC's key capabilities is for rapid diagnosis of pathogens, which is provided by our dedicated 24/7 standby Clinical Service Diagnostic Laboratory (CDSL) based in DSO. This laboratory uses state-of-the-art molecular diagnostics to rapidly pinpoint the cause of the outbreak and enables BDFC to institute specific containment measures to prevent further spread.

EPIDEMIOLOGICAL SURVEILLANCE & DATA ANALYTICS

BDFC also partners with CIDER to conduct epidemiological surveillance and data analytics. Ongoing surveillance enables year-on-year evaluation of vaccine effectiveness which guides BDFC in its vaccination policy. The Acute Respiratory Infection (ARI) surveillance programme is a prime example of the BDFC-CIDER collaboration in epidemiological surveillance. The Annual Influenza Vaccination Exercise (AIVE) implemented in 2010 to vaccinate all recruits was a result of the ARI surveillance programme which showed that there was a high proportion of servicemen with influenza. This was expanded to an SAF-wide vaccination



The 2009 H1N1 global pandemic was an important test for the newly-formed BDFC (it was established in 2008). The team stepped up to the challenge, ensuring adequate containment and response to the pandemic. The antiviral ring-prophylaxis strategy implemented was effective in reducing the incidence of new cases, and these findings were published in a key paper in the New England Journal of Medicine (NEJM).

On 22 Jun 2013, the SAF joined in the effort to fight the haze when it was tasked to distribute a million N95 masks to 88 locations island-wide. The island-wide distribution of N95 masks involved close to 200 servicemen and saw the mobilisation of 44 Multi-Role Utility Vehicles and three 5-Tonner trucks. Our servicemen and women from HQMC, SMTI, AMS selflessly dedicated their time to assist in the distribution of the masks.

programme in 2011, with yearly vaccination against the prevailing influenza strains in the Ministry of Health (MOH)-recommended vaccine. The ARI surveillance programme also allowed BDFC to evaluate the effectiveness of AIVE, demonstrating a marked decrease in influenza cases since the implementation of the programme. BDFC has also developed new capabilities in scenario modelling and cost-effectiveness analyses and has used this to evaluate potential new vaccines for implementation (for example, meningococcal vaccination).

PANDEMIC PREPAREDNESS

As the expert body in public health, BDFC spearheads all programmes aimed at equipping SAF with all the tools necessary for pandemic preparedness. The

2009 H1N1 pandemic has shown the unpredictability of today's infectious disease climate and the need for constant vigilance, especially in large organisations like the SAF. Lessons learnt from previous outbreaks and pandemics have showed that disease prevention is paramount even before mitigation of its spread.

In light of the MOH's revision of the National Pandemic Readiness and Response Plan in 2014, the Medical Corps reviewed the SAF's pandemic response plan and developed solutions to the unique challenges faced by military medical facilities, dovetailing disease prevention effectively with operational relevance.

Pandemics will continue to remain a global threat. Moving ahead, BDFC endeavours to ensure that the SAF pandemic readiness plan remains relevant. BDFC will also continue to drive capability development and institute new measures and technology to protect our soldiers.



From 2010 to 2016, BDFC has managed a total of 220 outbreaks affecting 4084 personnel, with an estimated operational downtime of approximately 20,000 man-days.

PUSHING THROUGH BOUNDARIES AND SEEKING NEW KNOWLEDGE

Over the years the SAF Medical Corps has expanded and specialised in a diverse range of military medicine expertise to serve the ever-evolving operational needs of the SAF. On many fronts, the Medical Corp has established itself as a leader in various aspects of military medicine not just in Singapore, but also within the region.

Military Medicine has also found relevance in mainstream medical practice. Since 2015, Military Psychiatry became part of the elective curriculum for the Psychiatry Residency programme. In 2017, SAF Psychiatrists started giving lectures as part of the Psychiatry module in Yong Loo Lin School of Medicine

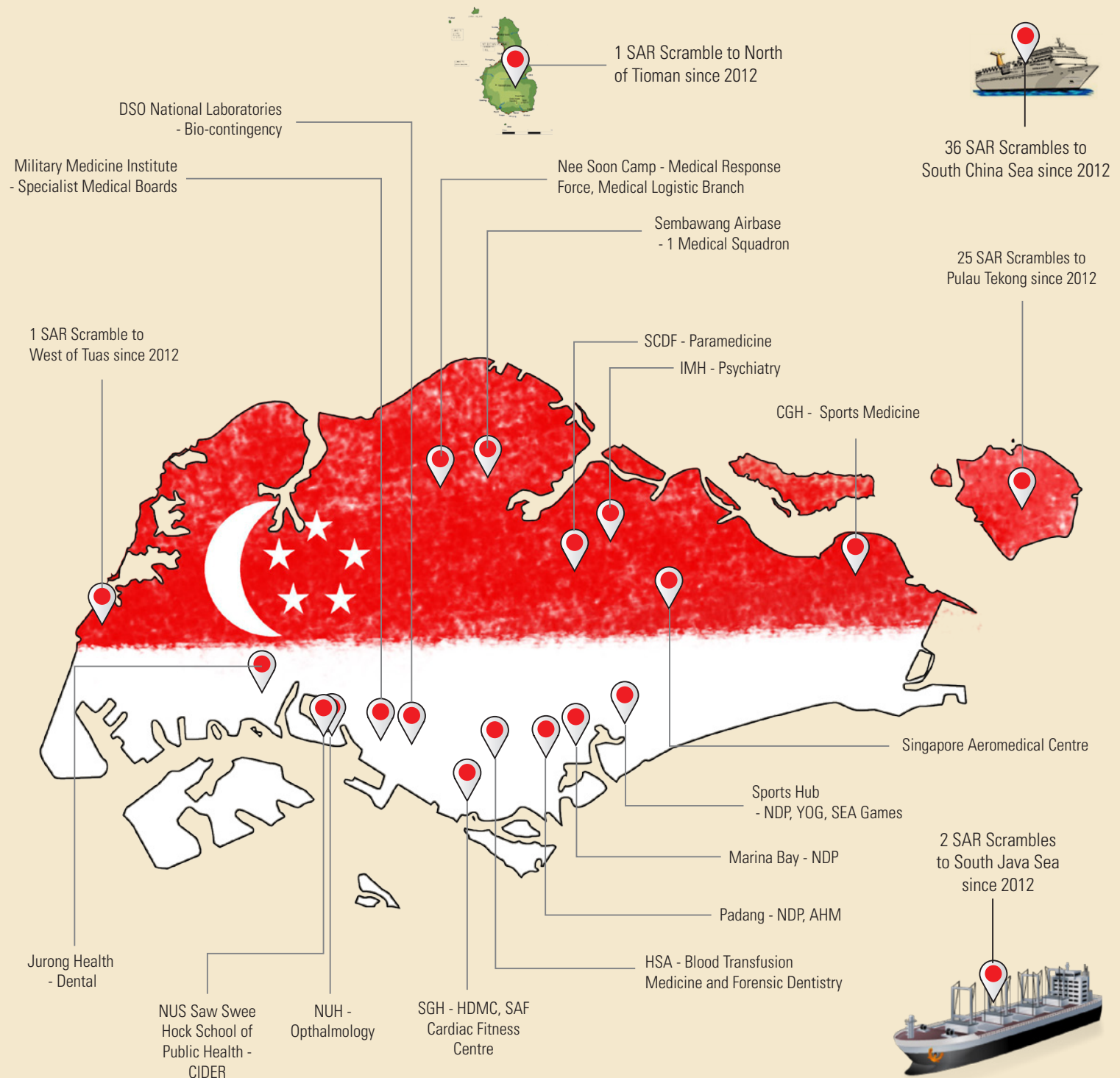
curriculum. Aviation Medicine was recognised as a subspecialty under Occupational Medicine in 2014. Every year, civilian doctors from both Singapore and other countries attend the Singapore Hyperbaric and Underwater Medicine Course (SHUMEC) jointly organised by RSN and Singapore General Hospital. The U.K. Diving Medical Advisory Committee (DMAC) accredited course equips them with the knowledge to conduct medical screening of divers and diagnose diving related medical conditions such as decompression illness (DCI). The course also certifies them as Ministry of Manpower (MOM) designated workplace doctors (in compressed air works).

Yet, as medical innovation and the understanding of human physiology continue to advance, the SAF Medical Corps must also continue to seek new knowledge. The way ahead may well be terra nova, uncharted waters and unexplored skies. But with quality men and women as fine stewards and innovation as the wind in our sails and beneath our wings, we are confident of pushing through boundaries and achieving new heights.

“Truly, it is indeed an honour and a privilege
to be able to serve the nation in uniform.”

- SLTC(NS)(Dr) Gregory Chan

WE SERVE THE BEST WE CAN



MEDICAL SUPPORT FOR NATIONAL-LEVEL EVENTS

NATIONAL DAY PARADE

The SAF Medical Corps looks after the safety and well-being of performers and spectators every year during Singapore's National Day Parade (NDP). As each year's NDP varies in concept, size and event venue, providing comprehensive medical support for participants and spectators alike is no mean feat. From the historical Padang grounds and the National Stadium to The Float at Marina Bay with its scenic backdrop, Medical Corps has been rigorously tested with the ever-changing demands to provide timely primary healthcare, emergency resuscitation and prompt evacuation to hospital when necessary.

Though the SAF Medical Corps has played a leading role over the years, medical support is augmented by the wider national healthcare system. Hospitals across Singapore treat casualties that come through their doors and provide manpower for on-site medical coverage. NUH provides on-site paediatric cover while KK Women and Children's Hospital (KKWCH) provides paediatric emergency medicine training to SAF medical personnel. SAF Paracounsellors and First-Aiders from organisations such as the Singapore Red Cross Society, People's Association Community Emergency Response Team (Cert), St John Singapore and NYP provide first point of care to spectators.



National University Hospital Paediatric team treating one of the child participants



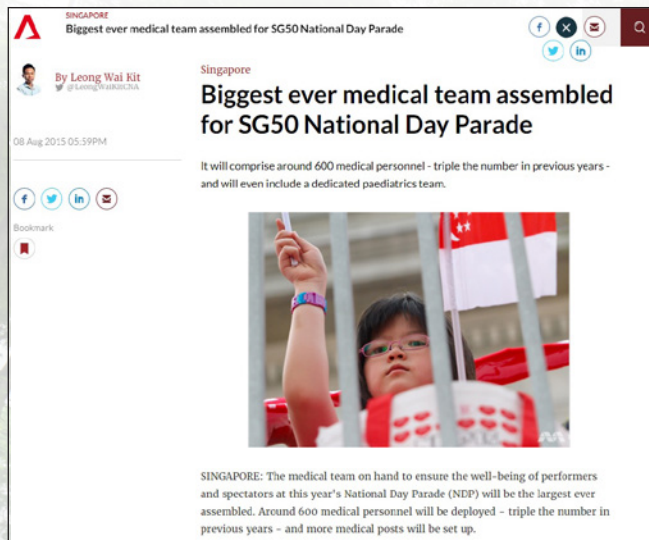


Paediatric medicine training conducted at KKWHC

Preparation for NDP usually begins months in advance. SAF medical teams provide on-site medical coverage during every rehearsal leading up to National Day as well as during the National Day Parade itself. As part of the National Response Force responding to mass casualties scenarios, these teams also conduct mass casualty training sessions with the Medical Response Force as well as teams from Singapore Civil Defence Force (SCDF).

In 2015, as part of the SG50 celebrations, the SAF Medical Corps deployed our largest ever team of medical personnel to support this significant milestone event. Around 650 medical personnel were deployed on the actual day of NDP (triple the number compared to

previous years!) to provide medical support for more than 200,000 spectators and participants at the Padang and Marina Bay. This was likely the largest national-level event in the history of Singapore.



Source: <http://www.channelnewsasia.com/news/singapore/biggest-ever-medical-team-assembled-for-sg50-national-day-parade-8250134>



MAJ(Dr) Aaron Chua and his medical team during SG50 rehearsals

“... with meticulous planning and the drive to ensure the highest standards of medical care delivery, we managed to pull it off. Numerous weekends were spent during the preparations and rehearsals leading to the actual Jubilee weekend celebrations. The success of NDP 15 would also not be achieved if not for the support from numerous civilian organisations including the First Aiders, Medical personnel from our national healthcare system as well as other sponsors.”

- MAJ(Dr) Lim Tianzhi,
NDP 2015 Medical sub-committee
secretariat



During NDP 2015, inflatable Red Cross balloon signages were deployed to allow NDP participants and the public to identify medical posts easily to seek medical attention.

To support NDP participants, hospitals across the island would waive the emergency department consultation and inpatient fees for all NDP participants who were referred to them.

SINGAPORE ARMY HALF-MARATHON

The Singapore Army Half-Marathon (AHM) is a signature event organised by the Singapore Armed Forces Reservist Association (SAFRA) and the Singapore Army, featuring the 21km Army Half Marathon and the SAFRA 10km Race. This annual running event has been held since 1992 with more than 30,000 runners taking part in the races annually.

Participation in the half-marathon is not without its risks. Provision of responsive medical support ensures the safety of the participants. Medical aid stations are positioned along the running route and staffed by SAF Medical Officers, Military Medical Experts and medics. The network of medical aid stations and ambulances are coordinated by a Medical Command Post.

Deployment of
medical tentages
during AHM 13.

“The main aim of the medical support plan is to improve access to pre-hospital care, so that severe casualties can receive appropriate medical treatment and be promptly evacuated to hospital, for a higher chance of survival. Meanwhile, participants with light injuries such as abrasions and lacerations can receive treatment on-site by nurses or paramedics, hence avoiding the need to visit the emergency department.”

- MAJ(Dr) Clive Tan
Medical Officer, AHM13

Having many years of experience in providing medical support to sporting events has enabled the Medical Corps to anticipate the spectrum of medical conditions, plan the most expeditious routes of evacuation for the seriously injured and improve patient outcomes. With a robust medical support plan in place, participants are able to enjoy the event with a peace of mind.

SG50 SEA GAMES

The 28th South-East Asian (SEA) Games 2015 was held in Singapore from 5 to 16 June 2015. More than 200 SAF medical personnel were deployed across 19 medical posts for the opening and closing ceremonies. To further augment medical support at all competition and training venues, more than 100 SAF medics were deployed across the island. The SAF Medical Corps also conducted professional training for approximately 500 volunteer paramedic assistants.

Volunteers from St John Singapore, Red Cross Society and People's Association acted as spotters and first-aiders in the spectator gallery. All casualties were immediately evacuated to the nearest first-aid post where they would be assessed and managed by the first-aiders. The use of cot stretchers also enabled expedient rearward evacuation to the medical posts.



Medical team with then-Chief Army Medical Officer, COL(Dr) Poon Beng Hoong (Second Row, second from left)



The SG50 SEA Games was the first time that medical buggies were deployed for medical support (not your usual golf buggies!) These smaller medical buggies could access off-road terrains previously inaccessible to ambulances, such as pedestrian pathways and boardwalks, to evacuate severe casualties as well as casualties with difficulty ambulating.

"... we had to manage almost 400 personnel, together with volunteers from St John Singapore, Red Cross Society, and PA Cert. The days were long as the medical team was always the first to arrive and last to leave. We also had to provide medical support during all the rehearsals. From the Medical Officers, Seniors Medics to the medics and First Aiders on the ground, everyone played their part to ensure that the events proceeded without a hitch! - CPT(Dr) Chew Shi Hao, medical sub-committee secretariat.

- MAJ(Dr) Chew Shi Hao
Medical sub-committee secretariat



" Together with my team of medical trainers from the SAF Medical Corps, we trained the medical and nursing student volunteers from NUS, NYP, NP and ITE(E) as assistants to our EMT and the medical team for the SEA Games medical support. It was very heart-warming to know that these volunteers were sacrificing their time during the school holidays and school terms to take part in the training. Their energy and enthusiasm on the ground was very palpable!

- ME5 See Yen Ling
Chief Trainer for Paramedical Assistant Training



YOUTH OLYMPIC GAMES 2010



The world's first ever Youth Olympic Games (YOG) was hosted by Singapore from 14 to 26 August 2010. 3,600 youth athletes between the ages of 14 and 18 competed in 26 different sports in multiple venues across the island. The Medical Corps worked with the Ministry of Health to provide on-site medical cover during the entire event. SMTI also equipped 390 nursing students from Nanyang Polytechnic, Ngee Ann Polytechnic and the Institute of Technical Education College East with the requisite skills and knowledge to function as paramedic assistants.

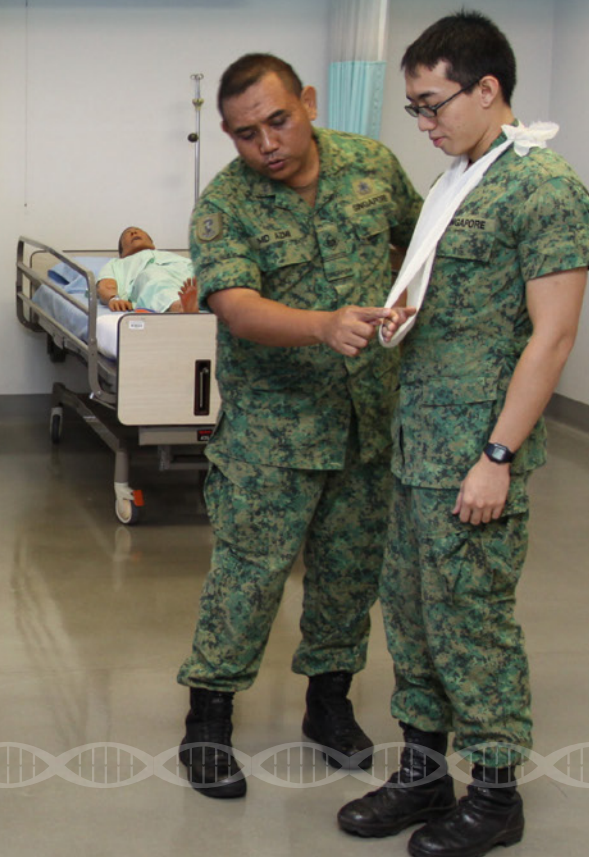
In the work-up to YOG, 32 paramedic instructors from SMTI conducted 3-day courses for the student volunteers to revise essential first aid skills and learn about the paramedic bag and ambulance equipment.



"The response was overwhelming - we had only 130 vacancies, but more than 140 students actually signed up. We could not accommodate all of them and had to turn some away,"

- Mr Chan Chee Beng

*Deputy Manager of Clinical Development
at the Nanyang Polytechnic's School of Health Sciences (Nursing),*



OPERATIONAL MEDICAL SUPPORT FOR SINGAPORE

NATIONAL SEARCH-AND-RESCUE (SAR) AND FIXED WING AEROMEDICAL EVACUATION

SEARCH AND RESCUE

In accordance with the International Civil Aviation Organisation's (ICAO) standards and recommended practices, Singapore maintains and operates search and rescue services within its maritime search and rescue region (SRR). Medical personnel from 1 Medical Squadron (1 MS) participate in SAR missions by delivering inflight medical care and stabilisation of conditions on the SAR helicopter en-route to tertiary hospitals in Singapore. The medical conditions treated were highly diverse, ranging from cardiac arrest to trauma patients, and even patients with acute surgical conditions and metabolic emergencies.

"... after the casualty was winched up to the aircraft, the medic and I quickly set to work on the casualty – taking his vital signs and inserting an IV line to run in saline fast. We were busy resuscitating the casualty throughout, and before long, mainland Singapore came into view. After the helicopter had landed, the casualty was quickly handed over to the waiting A&E team."

- CPT(NS)(Dr) Arron Ang

The 1MS SAR capability allows SAF to be first responders to medical incidents occurring within the South China Sea region, one of the busiest shipping lanes in the world. On 21 August 2017, the USS John S McCain collided with a commercial ship in Singapore's territorial waters. As part of a multi-agency search and rescue effort, Rescue 10 was scrambled to rescue and transfer stricken sailors back to Singapore General Hospital (SGH) for treatment. The medical crew deployed on board the Chinook to assist in the Search and Rescue effort included NSmen who were doing their In-Camp Training at the time of the incident.

"Scramble for Rescue 10, for an unconscious casualty in South China Sea. Scramble, scramble, scramble."



From right: CPT(NS)(Dr) Arron Ang and CFC(NS) Soh Poh How, with the patient (middle) they evacuated from South China Sea.



Rescue 10 is the call-sign assigned to the helicopter tasked for a Search-And-Rescue mission. 1 MS personnel undergo rigorous regular training to ensure that they are always ready to respond to any distress call at any time of the day.



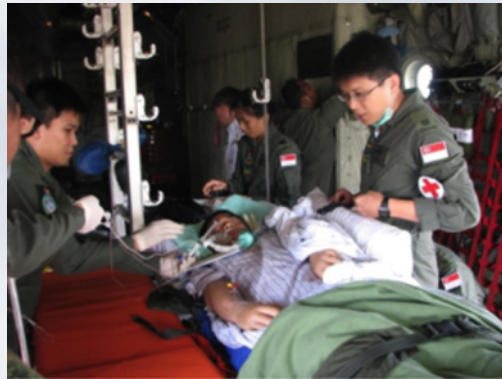
FIXED WING AEROMEDICAL EVACUATION

Since 1985, AFMS has conducted no less than 35 AME missions and successfully repatriated more than 80 SAF personnel and civilians back to Singapore. The first AME that the SAF was involved in occurred on 4 Nov 2000 to evacuate critically injured Singaporeans from Taipei involved in the SQ006 accident. A 28-man team comprising medical personnel from the RSAF and Singapore General Hospital were deployed in the AME mission on board the KC-135R.

More recently on 29 Jul 2014, RSAF's AME team was deployed to Darwin to evacuate a serviceman who sustained multiple head fractures and bleeding in the brain following a fall. The serviceman was successfully evacuated home to Tan Tock Seng Hospital (TTSH) Neurosurgical Intensive Care Unit (ICU) on-board the KC-135R.



AME Medical Team providing in-flight care to a casualty from the SQ006 crash in Nov 2000



AME for Army trooper with heat injury from Brunei on C-130H in Jun 2011



Patient transfer during the AME of an RSAF personnel from Darwin, Australia in Jul 2014



NATIONAL HYPERBARIC MEDICINE SERVICE

Since receiving its first hyperbaric chamber in the 1960s, RSN has established a robust medical support system for military diving and submarine operations and extended its expertise to Singapore and the region. As the nation's only resource in hyperbaric medicine, Navy Medical Service provided medical consultancy in compressed air works and supported projects such as the construction of underground tunnels for the Mass Rapid Transit projects in the 1980s and 1990s. It also provided a 24/7 emergency hyperbaric oxygen treatment capability for all recreational and commercial divers.

A major leap in development of diving and hyperbaric medicine in Singapore took place when the RSN and Singapore General Hospital (SGH) signed a Memorandum of Understanding (MoU) in 2008 to jointly provide recompression treatment to military and civilian divers, education and training for doctors, nurses and medics in diving and hyperbaric medicine, clinical hyperbaric research as well as medical equipment testing for use in the hyperbaric environment. The establishment of the Hyperbaric & Diving Medicine Centre was the first time that diving and hyperbaric medicine was integrated within the national healthcare system. Today, NMS continues to provide 24/7 recompression treatment



Opening of HDMC on 10 March 2009

to divers not only at the national level but also in the region and is well recognised as the regional centre of excellence for diving and hyperbaric medicine.

NMS also collaborates with HDMC to conduct the annual Singapore Hyperbaric and Underwater Medicine Course (SHUMEC) to train both military and civilian doctors. SHUMEC is the only internationally accredited Diving Medical Advisory Committee (DMAC) course that is conducted in the region and the course has improved the management of diving related conditions among the military and civilian doctors.



Civilian physicians learning how to operate a hyperbaric chamber during the SHUMEC course



LTC(NS)(Dr) Raymond Siew teaching at SHUMEC 17



One of NMS and HDMC's recent successes involved a recreational diver from Germany who had developed complete paralysis in her legs from severe decompression illness. After several cycles of recompression treatment, she regained function in her legs and is now recuperating and walking with assistance back home.

The actual hyperbaric treatment can be divided into 3 phases – compression, maintenance of pressure and decompression. During the "maintenance of pressure" phase, once the depth is reached, patients can relax and read a book, or watch a program on the in-chamber entertainment system, while breathing oxygen in a transparent hood or mask.

MEDICAL RESPONSE FORCE

In the event of a Chemical, Biological and Radiological (CBR) attack in Singapore, the SAF's Medical Response Force (MRF) is activated to provide medical support for decontamination and on-site medical assessment. The MRF is the medical counterpart to the SAF's Chemical, Biological, Radiological and Explosives (CBRE) Defence Group, which also includes 36th and 39th Battalions, Singapore Combat Engineers.

Established in 2001, it is a tight-knitted outfit of combat-trained MOs and medics. Although small, every single soldier in the unit, from MOs to the

Medical Decontamination and Treatment Vehicle (MDTV) drivers, is medically trained. The MRF is also frequently involved in providing CBR-capable medical support, when necessary, for various high profile or large-scale national events such as National Day Parade, Shangri-La Dialogue and the Formula One race. The MRF also supports the Singapore Civil Defence Force (SCDF) in mass casualty situations. Apart from the various active operational roles, the MRF is also responsible for training SAF medical centres so that they are able to function as first-responders for CBR incidents.

Smoke Chamber Training for Medical Response Force Medics



The MRF obtained the first batch of the new Mission-Oriented Protective Posture (MOPP) suits in October 2015. Some of its new features include improved chemical protection layer, lightweight and water-resistant material, inner lining to prevent the black carbon in the protective layer from rubbing off on the wearer and is less irritative on the skin.

When activated, the MRF will deploy with their Medical Decontamination and Treatment Vehicle (MDTV). The MDTV is a custom-built vehicular-based platform that can be pre-configured to be deployed for either decontamination or treatment of casualties.



A typical MRF Deployment Set-up using the Deployable Rapid Assembly Shelter (DRASH)



The Medical Decontamination and Treatment Vehicle: The decontamination configuration features two retractable side shelters with in-built roller tables and shower nozzles for casualties as well as one central compartment with an in-built shower system for multiple concurrent ambulatory casualties.

In situations of heightened security and terrorism, the MRF stands ready to respond to CBR situations at any time, 24 hours a day, 7 days a week. When called into action, it will deploy swiftly and efficiently to perform medical assessment and on-site decontamination to safeguard the safety of our nation.



The Medical Response Force Platoon administering treatment on the casualties affected by nerve agent in a simulated mass casualty scenario

OPERATIONAL MEDICAL LOGISTICS SUPPORT

HQ Medical Logistics is the bedrock supporting the full spectrum of medical operations for the SAF. The strong and strategic partnerships with defence partners, national agencies, public hospitals and medical institutions is a key element in ensuring an effective medical logistics support system and sustainable pharmaceutical supply chain.

The Defence Science & Technology Agency (DSTA) procurement team has been fronting procurement and contracting demands. In addition, collaborations with the Ministry of Health (MOH) and SingHealth Group Procurement Office (GPO) enables the SAF to leverage on the national procurement system to purchase standard medical stores. These collaborations have benefitted both the healthcare groups and the SAF through reduced supply chain spending by aggregating the purchasing power of multiple restructured hospitals and healthcare organisations.

The Medical Supply Warehouse at Army Logistics Base, operated by ST Logistics, provides centralised warehousing solutions and logistical support for all the services. This integrated medical logistics ecosystem enables the SAF Medical Corps to leverage on the relevant domain expertise and resources to be ready to support the full spectrum of SAF operations.

The SAF medical logistics support system has proven its effectiveness, especially in the support for various humanitarian and disaster relief missions. These include providing relief aid to victims of the Nepal earthquake in 2015, medical aid to displaced civilians affected by the ongoing tensions in Marawi in southern Philippines in Aug 17 and Rohingya refugees in Bangladesh in Oct 17. At home, SAF was called on to assist in the distribution of N95 masks during the SAR pandemic in 2003 as well as during periods of extreme haze. Medical Supply Warehouse was instrumental in ensuring that

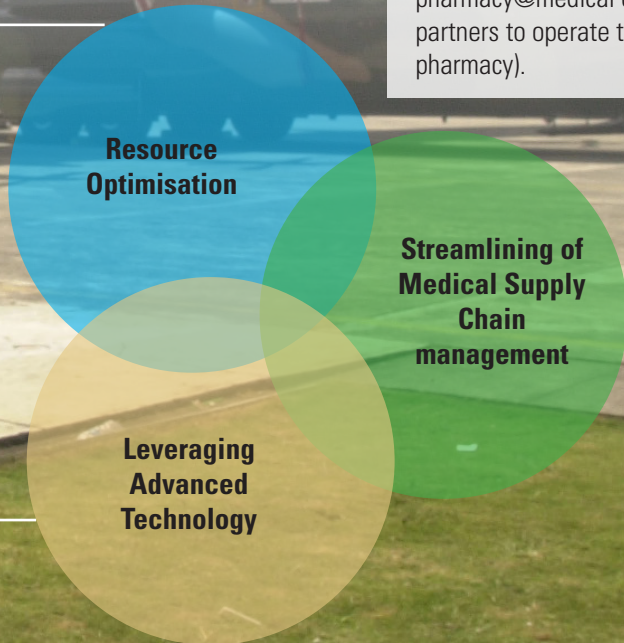
the relevant medical supply are prepared within a compressed response time. A holistic end-to-end medical logistics support flow is also critical in ensuring the successful execution of large scale national events such as the annual National Day Parade, the Southeast Asian Games in 2015 and the Youth Olympic Games in 2010.

Today, one of the main challenges for SAF medical logistics is the need to maintain a huge medical inventory which inevitably incurs a high logistics cost. Moving forward, the key strategy for HQ Medical Corps is develop a flexible and sustainable medical logistics system. A flexible supply chain can quickly adjust to swings in supply and demand, and avoids the need to maintain excess inventory. This can be achieved through: (1) Resource Optimisation (2) Streamlining of Medical Supply Chain management and (3) Leveraging Advanced Technology.

Rationalise the excess medical inventory at medical units and optimise medical resources at Medical Supply Warehouse to provide centralised medical logistics support for training and operations

Enhance the electronic Enterprise System for inventory management and to explore an automated pharmaceutical dispensary machine in the medical centres

Capitalise on commercial partners' medical supply chain network to streamline supply chain management. For example the exploration of the concept of Retail pharmacy@medical centres (leveraging partners to operate the medical centre pharmacy).



COLLABORATIONS IN TRAINING AND MILITARY MEDICINE

ENHANCING THE NATIONAL PARAMEDIC SYSTEM

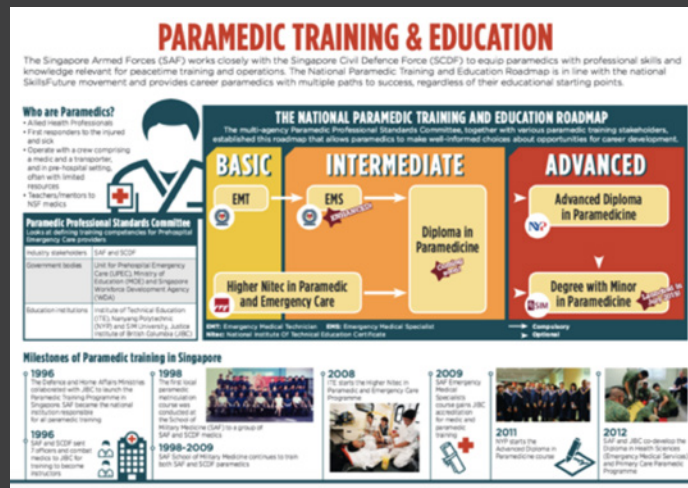
In 1996, MINDEF and the Ministry of Home Affairs collaborated with Justice Institute of British Columbia (JIBC) to launch the Paramedic Training Programme in Singapore. Since then, SAF Medical Training Institute has been responsible for conducting all paramedic training in the SAF and SCDF.

DEEPENING NATIONAL PARAMEDIC TRAINING AND EDUCATION

On 16 Oct 2015, Senior Minister of State for Defence Mr Ong Ye Kung launched the National Paramedic Training and Education roadmap. This was a multi-agency effort led by the SAF and the Singapore Civil Defence Force (SCDF) and supported by the Ministry of Education, the Ministry of Health and the Singapore Workforce Development Agency. The roadmap charts the multiple pathways for paramedics to deepen industry-relevant skills and knowledge and pursue professional upgrading regardless of their educational start points. Six institutions (SAF, SCDF, Institute of Technical Education (ITE), Nanyang Polytechnic (NYP), UniSIM and the Justice Institute of British Columbia (JIBC)) signed a Memorandum of Understanding to establish collaboration between employers of paramedics and education institutions to encourage skills mastery in the paramedicine field.



SAF Military Medical Experts and civilian counterparts have benefited from the roadmap



In recognition of the clinical relevance and employability of Emergency Medical Technicians (EMT), the EMT Course was awarded the Workforce Development Agency (WDA) Workplace Skills Qualification (WSQ) certification.



Maintaining a strong collaboration with JIBC

SUPPORTING HOMELAND EMERGENCY RESPONSE

In a new collaboration announced in September 2017, SAF paramedics will undergo training to operate and function as part of the SCDF ambulance crew. The pilot project enhances the interoperability of the SAF and SCDF medical personnel as part of one emergency ambulance Team. Additionally, the collaboration will also enable the SAF to fine-tune operating procedures with SCDF to optimise medical response during homeland security and civil contingency operations.

SAF medics to work in SCDF ambulances in pilot tie-up

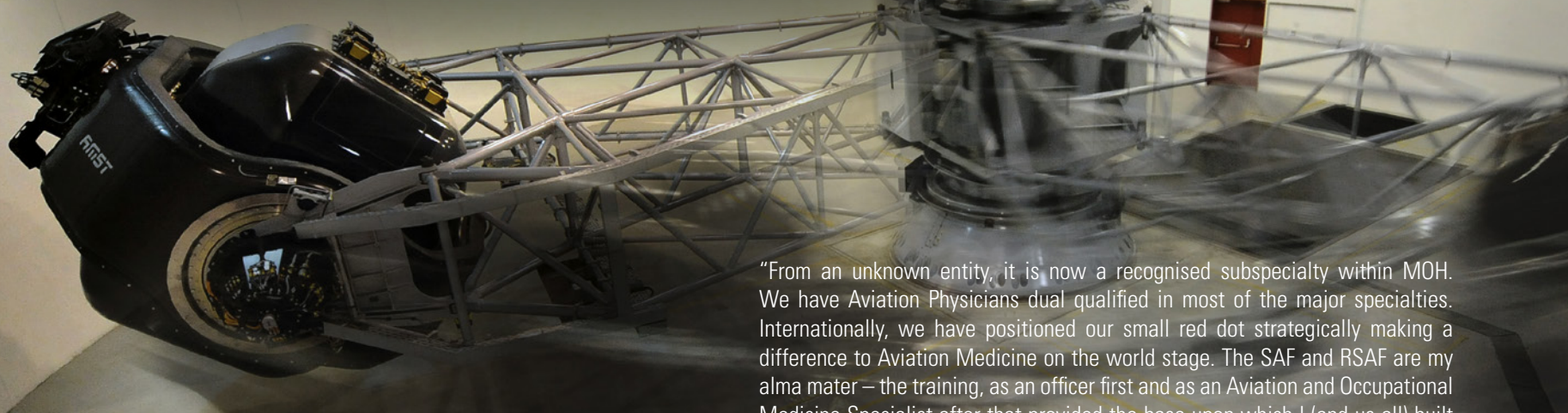


A pilot starting in September will involve 12 SAF medics who will work closely with SCDF ambulance personnel to deliver medical responses. PHOTO: SINGAPORE CIVIL DEFENCE FORCE

DEVELOPMENT OF AVIATION MEDICINE FOR SINGAPORE AND THE REGION

Aviation Medicine in Singapore has developed very rapidly since it was introduced in 1968, both through the establishment of military as well as civil centres of excellence in aviation medicine. Today, the Republic of Singapore Air Force Aeromedical Centre (ARMC), the Civil Aviation Authority of Singapore's Civil Aviation Medical Board (CAMB) and the Singapore Aeromedical Centre (SAC) continue to collaborate closely, train and qualify successive generations of Aviation Medicine physicians.

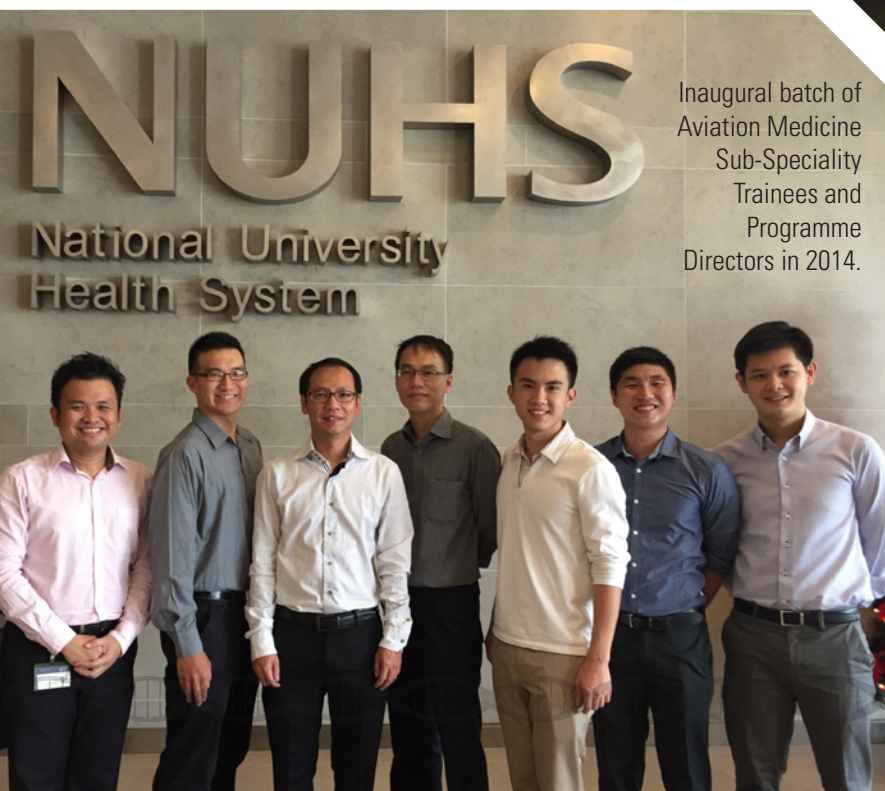
As part of the Society of Aviation Medicine Singapore (SAMS), ARMC played a pivotal role in driving efforts for the formal recognition of Aviation Medicine as a subspecialty by the Ministry of Health in May 2014. This was an important step in establishing Aviation Medicine as a viable option of specialisation for future generations of doctors, thereby sustaining and growing the specialty to support Singapore's aviation sector.



"From an unknown entity, it is now a recognised subspecialty within MOH. We have Aviation Physicians dual qualified in most of the major specialties. Internationally, we have positioned our small red dot strategically making a difference to Aviation Medicine on the world stage. The SAF and RSAF are my alma mater – the training, as an officer first and as an Aviation and Occupational Medicine Specialist after that provided the base upon which I (and us all) built our careers and our lives. Without that grounding, none of us would be where we are today."

- Dr Jarnail Singh

*Chairman Civil Aviation Medical Board,
President IAASM, former SMO(RSAF)/Hd ARMC*



Inaugural batch of
Aviation Medicine
Sub-Specialty
Trainees and
Programme
Directors in 2014.

Through the RSAF Aeromedical Centre and the Singapore Aviation Academy, the country is also recognised as a key provider of clinical Aviation Medicine and physiology training in the Asia Pacific region. Singapore is also well represented in key appointments for various international Aviation Medicine professional bodies and has also chaired the International Civil Aviation Organisation's Medical Provisions Study Group, which is responsible for the continuous review and revision of existing international flight crew and Air Traffic Controllers licensing medical requirements.

ENHANCING SOLDIER PERFORMANCE THROUGH SPORTS MEDICINE



The Exercise Prescription guide that SAF MOs now use to guide their consults with servicemen

Since 2011, the SPC and CGH Changi Sports Medicine Centre (CSMC) have been working closely to provide enhanced diagnosis, treatment and rehabilitation services for SAF personnel with musculoskeletal injuries. More than 1,000 SAF personnel have benefitted from this service annually, enjoying faster recovery and minimising training downtime.

The collaboration between SPC and CSMC also included the co-development of treatment guidelines for SAF Medical Officers to better diagnose and treat servicemen with joint and muscle conditions, the conduct of regular Military Sports Medicine workshop for SAF Medical Officers and opportunities for joint research initiatives in the field of Military Sports Medicine. In order to grow expertise to design and implement systems-level prevention and performance optimisation programmes, the Military Sports Medicine post-graduate training programme was successfully implemented in the SAF in 2014.



Then CARMO COL(NS)(Dr) Poon (seated, second from left) and Chairman Medical Board Prof Teo (seated, second from right) signing the MOU on 29 Nov 2011.

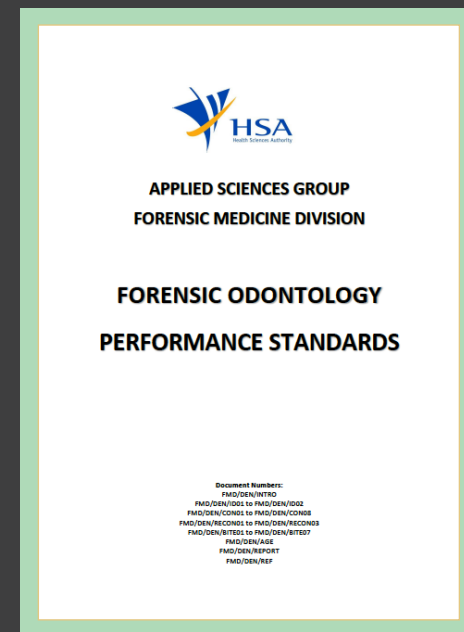
DENTAL COLLABORATIONS WITH THE NATIONAL DENTAL SYSTEM

FORENSIC DENTISTRY

As the local leader and repository for forensic odontological expertise, SAF Dental Branch worked closely with the Forensic Medicine Division, Health Sciences Authority (HSA) in the development of the first Standard Operating Procedure Manual in Forensic Dentistry.

The SAF Dental Branch is also involved in building up the nation's odontological Disaster Victim Identification (DVI) capabilities. This includes participating in joint exercises with the Home Team and HSA to test the resilience of the local DVI processes and capabilities as well as training local dentists in the principles of Forensic Dentistry so that they can competently assist the specialist Forensic Odontologists. In Nov 2016, SAF Dental Branch, together with HSA, also organised the first local forensic dental course to train local dentists and oral health therapists.

Moving forward, this specialised field of Forensic Dentistry would further be developed with a collaboration with Ng Teng Fong General Hospital (NTFGH) to advance research collaborations and training in military dental conditions such as barodontalgia, traumatic dental injuries and temporo-mandibular joint disorders.



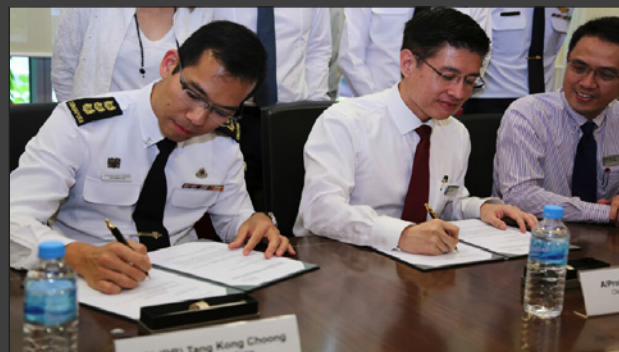
The fourth iteration of the Oral Maxillofacial Trauma and Forensic Dentistry Symposium, 19 – 20 Jan 2017.



Participants of the Oral Maxillofacial Trauma and Forensic Dentistry Symposium 2017 in a simulated forensic dental examination.

SPECIALIST DENTAL SERVICE PROVISION

Collaborative efforts between Jurong Health and the SAF Medical Corps were initiated through the Exchange of letters in 2015. This collaboration included provision of specialist dental services to SAF service personnel, clinical training and continuing professional education for SAF Dental Officers.



Exchange of Letters with Jurong Health, Aug 2015



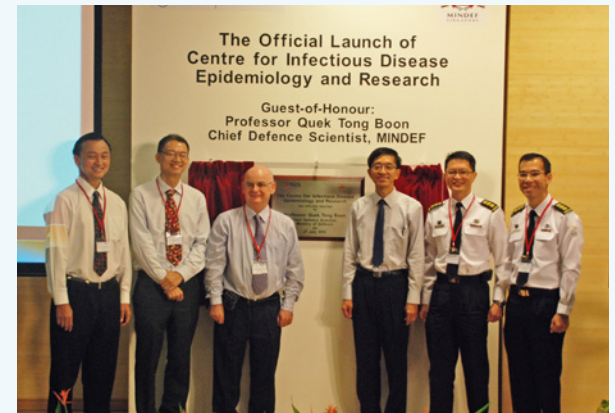
COLLABORATIONS IN TRAINING AND MILITARY MEDICINE

BIODEFENCE AND INFECTIOUS DISEASE PREVENTION

The SAF's contributions to infectious diseases prevention extend beyond Singapore to the wider regional and global scientific community. SAF staff has also been seconded to the World Health Organization (WHO) — a clear recognition of the quality and expertise of SAF personnel.

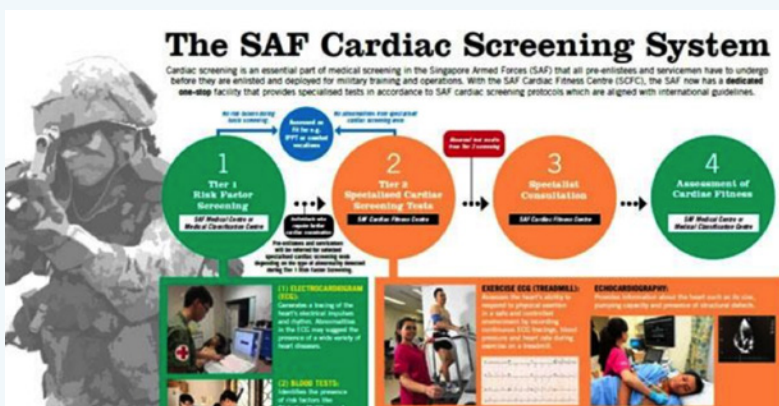
The SAF builds on its strong biodefence framework by leveraging on both local and international partners. Internationally, the SAF has established collaborations with our regional and international military counterparts to optimise research efforts and to ensure timely exchange of information on emerging infectious diseases. Locally, the SAF collaborates with agencies and institutions such as the Defence Science Organisation (DSO) National Laboratories, MOH, National Environment Agency, Agri-Veterinary Authority of Singapore, Saw Swee Hock School of Public Health and local hospitals to build the necessary linkages for exchange of information and expertise. The establishment of the Centre for Infectious Disease Epidemiology and Research (CIDER), a joint collaboration between the Ministry of Defence (MINDEF) and the National University of Singapore (NUS) in 2011 was one such initiative.

CIDER was set up as a professional academic and research centre focusing on research and development efforts to reduce the public health burden caused by infectious diseases locally and in Asia. The Centre develops epidemiological capabilities for disease surveillance, consultation and research to deter and to control potential infectious disease outbreaks. CIDER plays a pivotal role in enhancing the SAF's early warning disease surveillance system, allowing the SAF to monitor disease trends and detect changing patterns which may signal potential outbreaks. In 2009 during the H1N1 outbreak, CIDER's Acute Respiratory Infections surveillance programme was crucial in guiding our SAF response.



ONE-STOP CARDIAC FITNESS CENTRE

On 16 January 2015, the SAF Cardiac Fitness Centre (SCFC) was launched in collaboration with the National Heart Centre Singapore (NHCS), as a one-stop specialist centre for pre-enlistees, SAF regulars and SAF Operationally Ready National Servicemen who have been referred by SAF Medical Officers to undergo specialised cardiac screening investigations. Prior to the opening of SCFC, a serviceman identified with cardiac abnormalities by the SAF medical centres would have had to visit multiple healthcare institutions for specialised tests and treatments.



Source: MINDEF



The SAF taps on the deep expertise of NHCS to ensure that a high standard of cardiac screening is maintained. Specialised cardiac investigations include exercise electrocardiogram, routine echocardiography, stress echocardiography, Myocardial Perfusion Imaging and Computed Tomography (CT) Coronary Artery Calcium Score (CACS).

Prof Ivy Ng, Group CEO of Singhealth, having a discussion with COL Ng, SMSO, on the establishment of the SCFC.

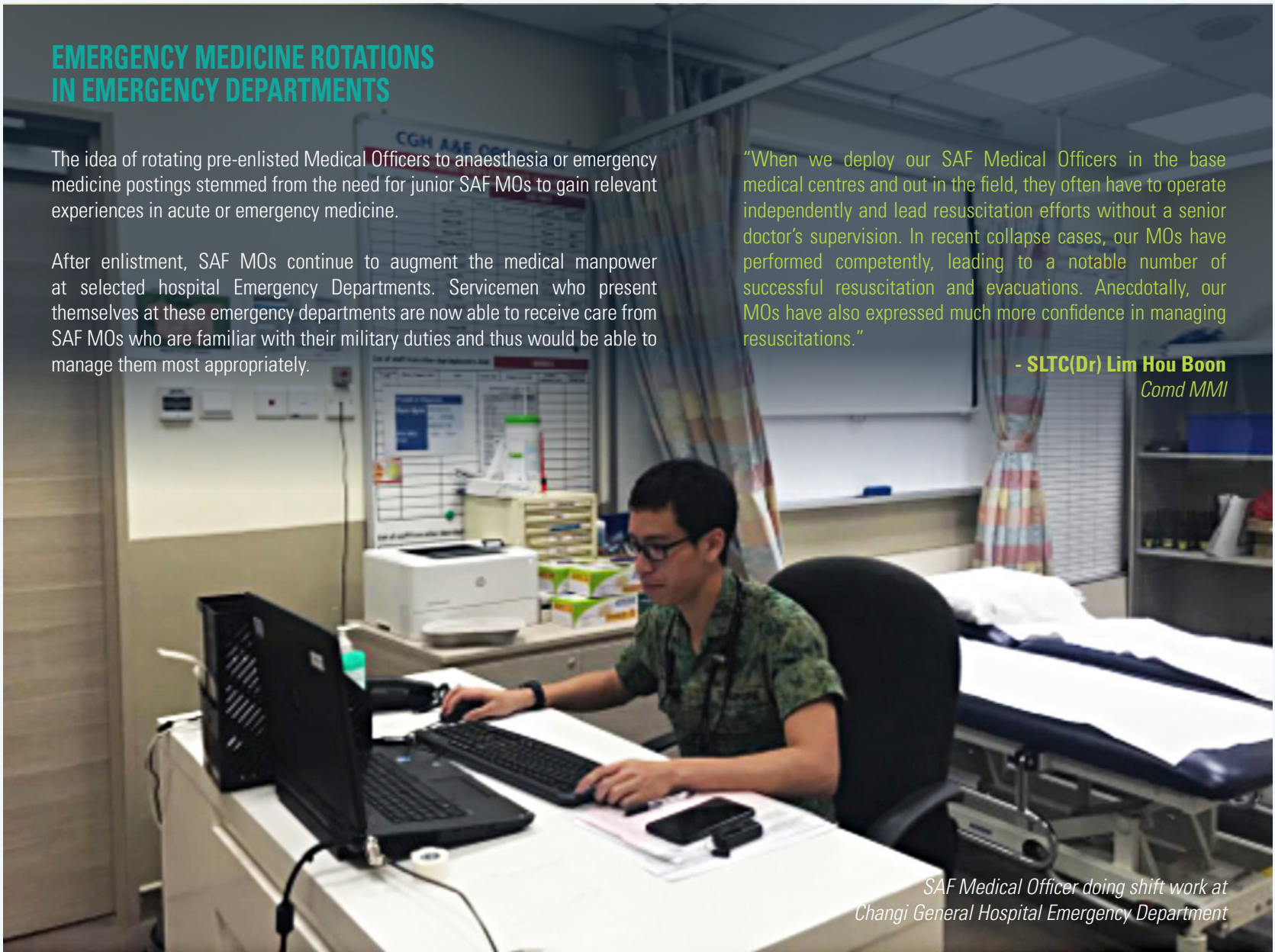
EMERGENCY MEDICINE ROTATIONS IN EMERGENCY DEPARTMENTS

The idea of rotating pre-enlisted Medical Officers to anaesthesia or emergency medicine postings stemmed from the need for junior SAF MOs to gain relevant experiences in acute or emergency medicine.

After enlistment, SAF MOs continue to augment the medical manpower at selected hospital Emergency Departments. Servicemen who present themselves at these emergency departments are now able to receive care from SAF MOs who are familiar with their military duties and thus would be able to manage them most appropriately.

“When we deploy our SAF Medical Officers in the base medical centres and out in the field, they often have to operate independently and lead resuscitation efforts without a senior doctor’s supervision. In recent collapse cases, our MOs have performed competently, leading to a notable number of successful resuscitation and evacuations. Anecdotally, our MOs have also expressed much more confidence in managing resuscitations.”


- SLTC(Dr) Lim Hou Boon
Comd MMI



SAF Medical Officer doing shift work at Changi General Hospital Emergency Department

PUTTING THE PIECES TOGETHER

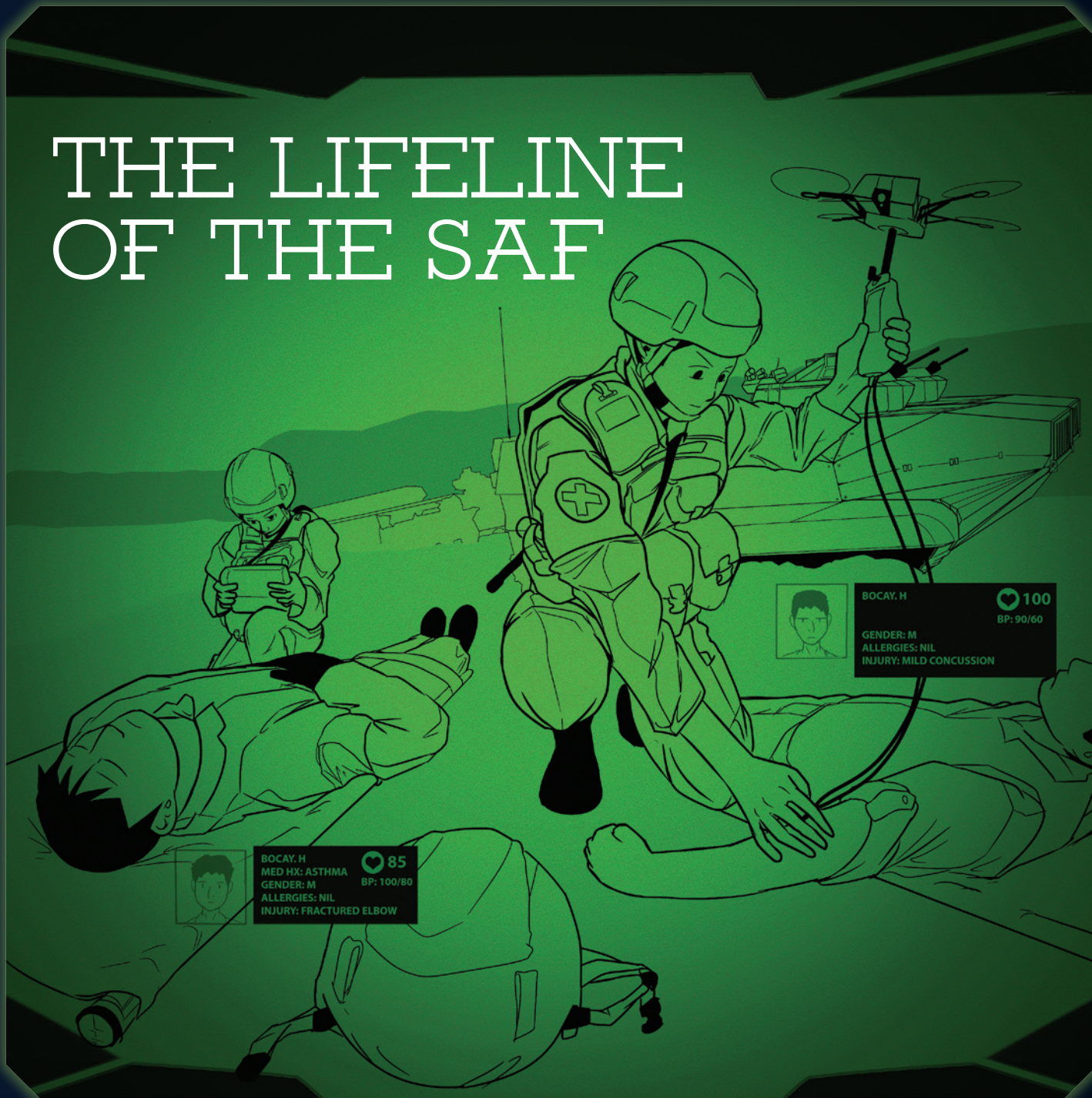
Our nation’s stability and success is dependent on the five pillars of Total Defence. Whilst the SAF Medical Corps remains steadfast in supporting the SAF in its role in Military Defence, the medical support rendered to large-scale National Events, collaborations with other healthcare institutions and the provision of critical medical assets for Singapore cements the SAF Medical Corps’ role in the Total Defence of Singapore.



"The future operating environment for the SAF will be a challenging one. Emerging threats and socio-demographic changes in Singapore will require the SAF to develop new fighting concepts and at the same time harness the potential in every soldier, sailor and airman in order to maintain the fighting strength of the SAF."

– **RADM(Dr) Tang Kong Choong**
Chief of Medical Corps

THE LIFELINE OF THE SAF



BOCAY, H

100
BP: 90/60

GENDER: M
ALLERGIES: NIL
INJURY: MILD CONCUSSION



BOCAY, H

MED HX: ASTHMA
GENDER: M
ALLERGIES: NIL
INJURY: FRACTURED ELBOW

85
BP: 100/80



THE ENHANCED MEDIC

"I will like to see drone technology incorporated to the last medic. I will also like to see the use of Near-Field Conduction devices to facilitate the chain of evacuation, from frontline to home, in peace and war, where the concept of tracking individuals with the corresponding data chips become a reality."

- MAJ(Dr) Lim Lian Kiat
Head GS, HQ AMS

"Technology will continue to change with the times, but it will always only be a tool. What will not change, is the fact that to train good medics; you need good people. Passionate and committed teachers, who explore means, such as the use of technology, to inspire students and kindle the spirit of inquiry, are essential to grooming competent, confident and committed medics of the future."

- MAJ(Dr) Benjamin Chin
*Head, Training and Learning
Science Branch, SMTI*

Compared to the SAF Combat Medic in days of yore, with only a small medical orderly pouch slung across his chest, the SAF Combat Medic of the future is envisioned to be a highly effective warrior-healer, augmented by technology for better treatment outcomes. As technology advances, our SAF Medics must be able to sense-make and problem-solve by utilising the resources and technology available to save more lives. Technology is merely a means to an end. It is never about the stethoscope because it is what goes between the ear pieces that matters.

The load of a Combat Medic can be as heavy as full-grown Golden Retriever.

OPTIMISING MEDICAL TRAINING

Technology will transform the training of our medics. Virtual reality and augmented reality simulation as well as interactive platforms utilising artificial intelligence will enhance realism in managing combat wounds. High-fidelity medical simulation will provide a platform for safe and realistic training to hone the individual and team skills of Medical Officers, Military Medical Experts and Medics, in turn engendering greater confidence and clinical competency.

“Possible future technology that could revolutionise our operations would include an effective means of casualty decontamination that is not reliant on a water source – a gel or powder that works just as well in deactivating various chemical agents on skin and wounds, a thinner and more nimble protective suit that may even deactivate chemicals on its surface - these will improve the heat load, dexterity and even the protection afforded.”

- CPT(Dr) Andrew Tan
Officer Commanding, MRF

“Besides technology, performance maximisation is also achieved through targeted exercise regimes. We aim to understand better the roles and routine tasks of various vocations to anticipate the physical demands and possible injuries associated with those vocations, so as to design suitable training regimes for them.”

- ME1 Amos Teo
*Basic Combat
Fitness Trainer*

“Medical Simulation not only recreates various situations for peacetime missions, but also trains medical personnel to respond in wartime scenarios. There has also been a shift in teaching pedagogy to better engage the trainees – reducing time in classical classroom settings and use of multimedia to aid trainees’ acquisition of knowledge. The classical classroom has also been reinvented into a new-age classroom; even the lightings have been looked into to facilitate the trainees’ learning!”

- SLTC(Dr) Lee Wei Ting
Comd SMTI

EQUIPPING THE SAF MEDIC

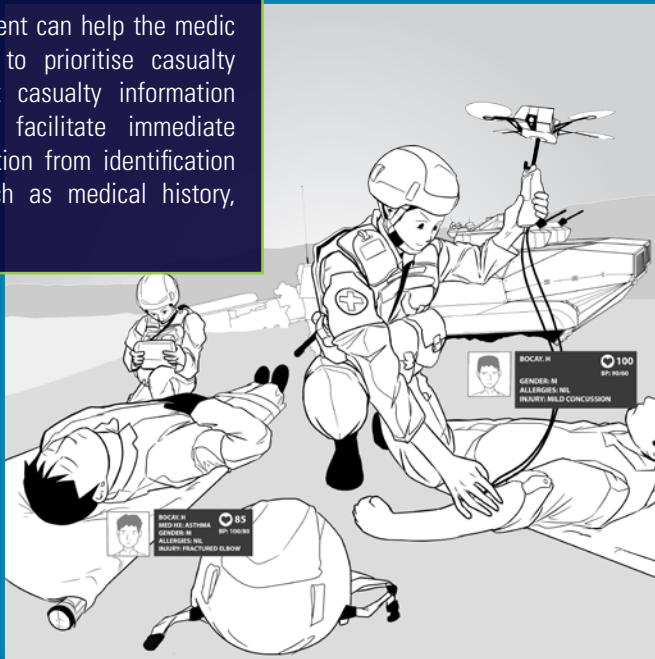
On-site combat casualty care will also be augmented by soldier-centric technology. Existing products in the market such as wearables are already being explored to provide real-time casualty information. Layering on mobile applications with a robust and secure wireless connectivity can potentially aid medics on the ground with a secured route to navigate to casualties and help medics keep stock of the usage of medical supplies automatically. Portable miniaturised devices for diagnosis, treatment, evacuation and communications can also enhance the capabilities of our medics during operations.



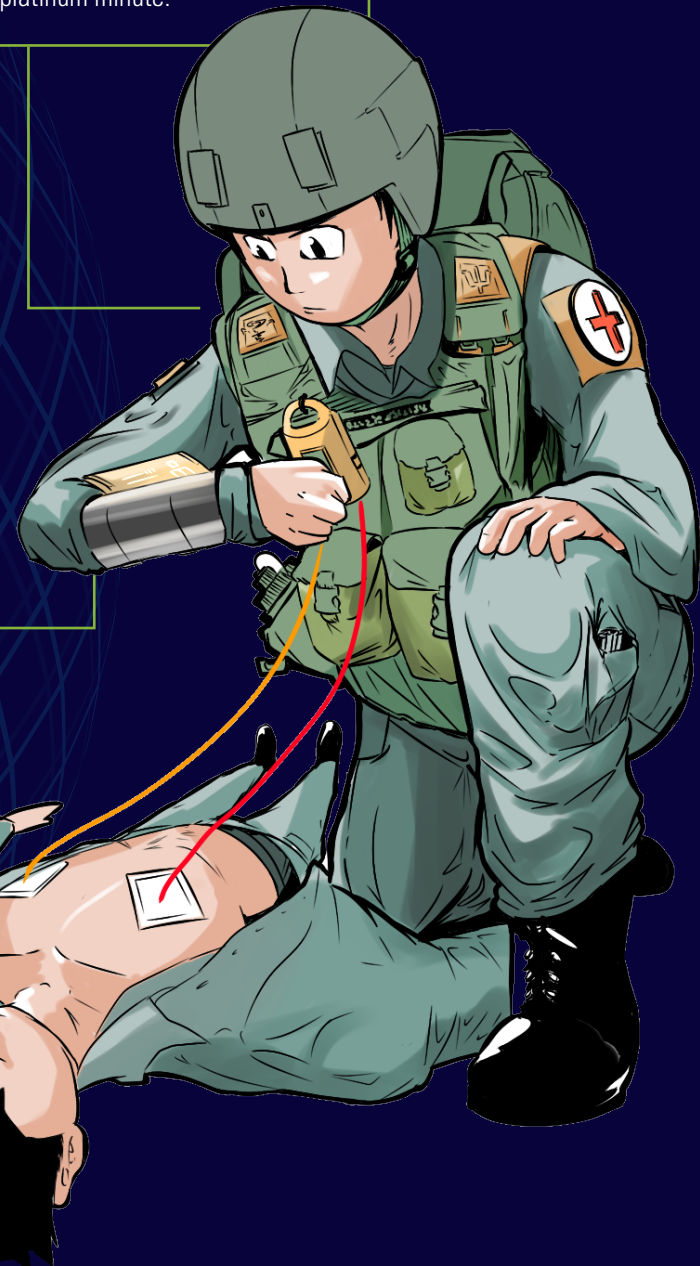
Centre of Excellence for Soldier Performance is currently conducting trials using wearables to track soldier fitness.

AUGMENTED ON-SITE CARE

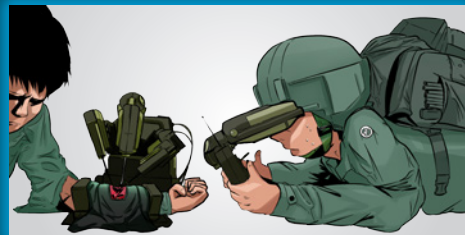
Rapid casualty assessment can help the medic in the triage process to prioritise casualty management. A robust casualty information retrieval network can facilitate immediate access to vital information from identification tags of casualties, such as medical history, allergies and blood type.



Shouting “Medic! Medic!” helplessly will be a thing of the past. When a soldier is injured, the buddy will no longer shout for the medic at the first instance because every soldier is trained and equipped enough to be the first responder for his buddy, to give treatment during the platinum minute.



Portable advanced diagnostic modalities may augment clinical judgement. This could take the form of an all-in-one medical scanner or biomarkers for severe injuries. Results may be automatically synced in real-time to a central database for documentation while the medic is stabilising the casualty.



Treatment modalities will also be transformed with advanced technology. Powdered (lyophilised) blood products that convert readily to fluid state, haemostatic wound dressing to staunch blood loss and robot-assisted bullet extraction are innovative ideas that would revolutionise the domain of field emergency medical treatment. The timely adoption of the relevant technologies will enhance pre-hospital care to our soldiers.

BATTLEFIELD AWARENESS AND COMMUNICATION



At the medic level, rapid casualty assessment using a heads-up monitoring system will automatically upload casualty information and vital parameters such as heart rate and blood pressure real-time to update the casualty information network. Telemedicine will further enhance the field management of casualties.



At the Battalion or Brigade HQ, real-time information on casualties, medics and enemy locations will provide a bird's eye perspective of the battlefield situation. The number of medics deployed, location of medical facilities providing various levels of care as well as unit attrition will be automatically analysed to enable field commanders to make expedient decisions on casualty evacuation and replacement of troops efficiently.



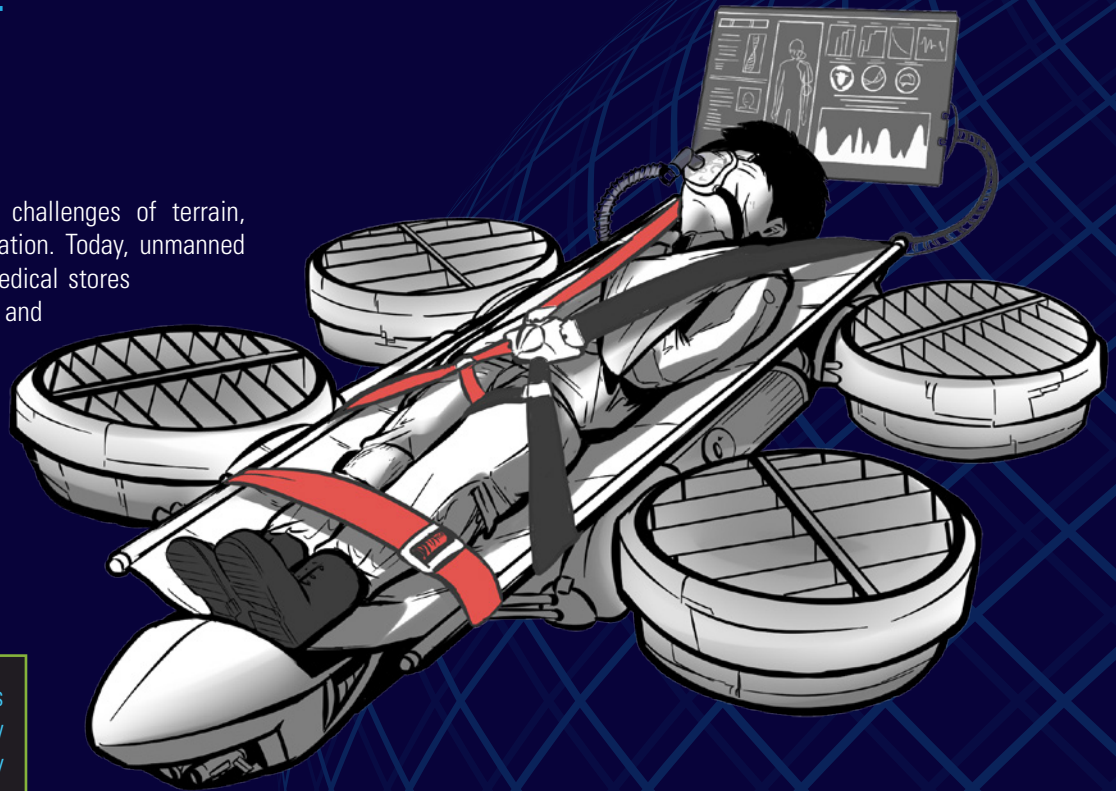
Compared to how cholera was first detected when Dr John Snow detected cholera using manual data collection, we possess massive computing power today and can harness the potential of big data to accelerate analysis of patient information. Image shows the original map that Dr John Snow used to solve the cholera epidemic.

At the Medical HQ, a dashboard of medical posts, level 1, 2 and 3 medical facilities and evacuation assets will receive real-time updates from units in the field. Information on medical manpower and logistics status will also enable the larger support system to push out timely replenishment and avoid delays. Resource management will also be enhanced by tapping on artificial intelligence to autonomously plan rearward evacuation and decanting of casualties to avoid overloading of medical facilities.



INNOVATIVE EVACUATION MODALITIES

Innovative solutions can overcome the current day challenges of terrain, availability of en-route care and expediency of evacuation. Today, unmanned aerial drones have already been tapped to transfer medical stores and laboratory samples. Load-bearing exoskeletons and robots are deployed to transport heavy equipment and stores. With sufficient operational drive and some ingenuity, it is not far-fetched to look towards a future with unmanned drones transporting severe casualties without requiring an en-route care team. If we stretch our imagination further, could the evacuation of an unconscious casualty underwater be a reality?



“Seamless yet accurate transfer of patient data is paramount in the next bound of evacuation. How about RFID chips that are inserted subdermally? Early warning for the type of patient to be expected at the next echelon of care can only benefit the casualty.”

- LTC(Dr) Timothy Teoh

“It is very useful if medics can seek advice from physicians via telemedicine especially when operating in remote areas without any MO available. We need the capability to transmit diagnostic findings like ECG or parameters more effectively so as to be able to paint the whole picture of the casualty’s condition while the casualty is being evacuated.”

- ME3 Khairudin Rahmat
OC, EMS Course, SMTI



“Unmanned vehicles, consisting of aerial, surface and ground vehicles have come to the forefront of humanitarian technology innovation to preserve human lives. These can be achieved through efficient victim detection under debris, enhanced first responder capabilities and providing a speedy mode of evacuation. However the complexity of the disaster environment such as civil-military relationships requires ground troops to continue to be relevant in modern disaster relief operations to express empathy for the victims and engender the public’s confidence in their rescue efforts.”

- CPT(Dr) Nicholas Lim Song Ping
Dental Officer

The raison d'être of the SAF Medical Corps remains unchanged, which is to ensure robust and responsive medical care for our soldiers, sailors and airmen. Adoption and development of advanced medical technology is a key enabler for mission success. Nevertheless, the men and women of the SAF Medical Corps are our core asset. The continual nurturing of our people remains our priority.



"The Medical Corps is the lifeline of the SAF. You see the drip and the medic inserting the drip? That's literally a lifeline and we have combat medics on the ground. The Platoon Medic, Company Medic, the BCS, the Medical Companies, the helicopters to the Surgical Companies and the Rear Hospitals - that is also a lifeline, the chain of evacuation is manned by people who are well trained and capable. This statue embodies the lifeline of the SAF."

- **BG(Ret)(Dr) Lionel Lee**
ex-CMC

INVESTING IN OUR PEOPLE, OUR CORE ASSET

"As I always say – what are we going to do in the future, we won't know; how to do those things, even more hazy. But something is crystal clear – who will be doing them! In 2030, our current year 1 medical students and our existing ME1s as well as polytechnic students who signed on with us, will be in service, and charting the direction for the next generation."

- COL(Dr) Lo Hong Yee
Chief Army Medical Officer



"I am thankful that our organisation planned and gave me the opportunity to be trained as a perioperative nurse... to be the first to be trained as a specialised nurse in Nanyang Polytechnic Advanced Diploma course. In order to be operational ready 24/7, I will need to maintain my knowledge and skills"

- ME5 Lim Poh Thiam
on the Military Domain Experts Scheme

"I felt very honoured to have been given the chance to further my medical skills. The Advanced Paramedic Diploma Course enhanced my medical skills through broadening of my clinical knowledge and giving me practical hands-on training. I feel more equipped, not only to perform my duties as a Naval Military Medical Expert, but also to train my juniors."

- ME2 Soh Kian Keong
on the Advanced Diploma in Paramedicine Course



"It is a once-in-a-lifetime experience and I am extremely thankful to have gone for this IDC program. Living by myself abroad for a year was a continuous process of growth and learning outside of my comfort zone every day. I also find myself to be a more confident and independent individual. I had the opportunity to practice examinations and simple procedures relating to reproductive health (digital rectal examination, collection of patient acquired samples, pap smear)"

- ME1 Jeffrey Goh
on Independent Duty Corpsman Training

"The Air Force MMEs are sent for overseas training to acquire valuable skills and experience. One of them is the Aeromedical Evacuation course conducted in Canada. Besides the technical skills, I also gained new perspectives from interactions with the foreign Air Force counterparts. Such courses allow our MMEs to enhance our capabilities, so as to contribute to the SAF's value in peace."

- ME2 Poon Siyong
on Airforce MME Training



FLYING OUR FLAG HIGH

"The strength of the SAF Medical Corps lies in our people. We should and must always spend the effort to mentor and groom our people as they will be the ones who will bring our Medical Corps into the future. The desire to save lives will always be in our DNA. I am confident that our people will excel in everything that they put their heart into."

- COL(Dr) Chow Weien

*Chief Naval Medical Officer
Comd Force Medical Protection Command*



"In the Underwater Medic course, we were trained to attend to diving medical emergencies and operate in a hyperbaric setting. This was something new to me. I was a registered nurse prior to joining the SAF in 2015. The training program was very intense. As a female leading a team of male soldiers, I have had positive experiences."

- ME1 Lim Gek Swee

*who was awarded BMT Company Best,
Golden Bayonet Winner during EMT (Spec)
Course and Best Trainee during Underwater
Medic Course*



"By God's grace, I did well during the course and clinched the Best Mission Command Paper - Jonathan Letterman Award, out of 197 students, with my research on the Battle of Tarawa and the Mission Command of Lt. Col David Monroe Shoup."

- MAJ(Dr) Jonathan Lim

*who graduated with distinction from the US
Army Medical Department (AMEDD)
Captains Career Course*



"This award is a testament to the rigorous professional training and ample research opportunities provided by the RSAF to our Aviation Medical Officers."

- LTC(Dr) Brian See

*who was awarded the Jeffrey R. Davis MD
International Aerospace Medicine scholarship*

WOMEN OF THE SAF MEDICAL CORPS



"It was a total leap of faith. Fortunately in BMT, I had a very inspiring platoon sergeant. She really showed us that women in uniform can be as good as or even better than any other men, no matter what vocation or field she chooses to be in."

"As females, I feel we have the capability of utilising soft power, and in a totally male dominated environment. Rather than being aggressive and being loud, we can talk sense, be smart and put it in a soft way, which does wonders. Females also add a sense of perspective of family life, and can be more approachable to servicemen. I hope that we can support each other and blast the way forward, so that people who will be coming up can look at us and say 'Look, it's possible. She did it. We can reach there.'"

- LTC(Dr) Shalini D/O Arulanandam
CO MCC and SAF Medical Corps' first female scholar



"My aspiration for females is that we can be competent and respectable leaders, and to be well-exposed in other non-medical domains such as Ops, finance, logistics so that we can contribute to the SAF in a greater capacity."

- ME4 Olive Lim
Med Coy Training Team OIC, SMTI



"My experience thus far has been fulfilling, being given opportunities to hold different appointments, as an instructor, as an overseas-based senior medic, and being able to participate in exercises as a senior medic in the SAF over the past 8 years. I have not only grown in my military and medical knowledge, but also developed as a person. I learnt how to be a better leader and this journey of learning has been amazing thus far."

- ME2 Tan Ting Ting
Brigade Senior Medic, 8 SAB

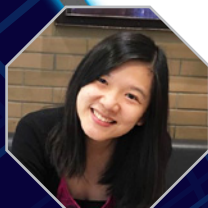


"I enjoyed the different types of challenges which surfaced along my career, and being able to contribute my part to the defence of our country, not to mention being able to be deployed for different types of missions. I do not find it a hassle to be deployed for the missions as a female. As a female, I felt it is a great honour to be able to participate in a mission. My aspiration for future females in the SAF Medical Corps is to be able to lead UN medical deployments."

- Ms Loo Mui Lian
*Senior Medical Training
Nursing Manager, MDTB, NMS*

"My time in the SAF has been awesome...the most memorable experience would be the period of EMT(Spec) training I'd gone through with SCTs! To be able to go through what our Medics have been through, learning the medics' protocols, how to conduct IV; going on ambulance attachments and hospital attachments. It was really exciting and memorable.... I'm especially impressed by my fellow colleagues' commitment and dedication to providing the best healthcare they can to our SAF men and women."

- Ms Chew Siew Tiang
*Cluster Manager,
Healthcare Cluster East,
MMI*



"Everybody goes through the same training and women accomplish the same tasks as men. As females, we may or may not be the fittest or the fastest, but we have the mental toughness and strong values that will guide us and see us through. At the end of the day our common mission binds us all as members of the Singapore Armed Forces; to enhance the peace and security of Singapore."

- OCT Ng Chen Hui
SAF Medical Scholar



TOGETHER, MEDICAL CORPS BEATS TOGETHER AS ONE

"Camaraderie is that mutual belief and tacit trust, both moulded by the hands of time, that you and your buddies will never let each other down."

- SLTC(Dr) Benjamin Tan
Chief Airforce Medical Officer



"The finest aspects of the Officer Training Wing in SMTI are the camaraderie, sense of belonging and identity. This team is essentially a mixed bunch and we don't actually get to choose the team, just like they don't get to choose their Course Commander! Nonetheless, we were able to form a tight-knit team bonded by common values and a strong sense of purpose – To provide the best learning experience for our cadets and trainees."



- LTC(Dr) Lim Huai Yang

*Head Advanced Training Centre, SMTI (2012 - 2014)
Course Commander of 76th, 77th MOCC & 25th NS MOCC*



"Camaraderie and brotherhood has taken a deeper meaning for me as my own brother serves in the Medical Corps as well. It's not simply spoken words but the unspoken words and actions that we see in times of need."

- MAJ(Dr) Freddy Tan Zhi Xiang

Head Medical Doctrine and Training Branch (Des), NMS



"Serving as a female DXO in the SAF Medical Corps has been an exciting journey for me. There are many different challenges and I am always learning something new every day!"

- Ms Charleen Natalie Neo

Manager (Medical Affairs), HQ MMI



"When we regard our soldiers as our children, they will follow us into the deepest valleys." This wisdom of Sun Tzu continues to be relevant to leaders as we nurture the current and future generations of SAF Medical Corps men and women, working together to provide the best of Military Medicine to people at home and afar, today and into the future."

- ME6 Daniel Chia Yee

Medic Instructor, SMTI



"Having worked with various batches of NSF medics daily, I understand the importance of building healthy and positive working relationships with them. We have good medics and better medics; but all will ORD when their time comes. Hence, it is important to cherish the time spent with each individual and work well with them to make their NS journey a meaningful and memorable one."

- ME1 Tay Rui Sheng Isaac
Medic Instructor, SMTI



"From weekly outings to annual dinners, this culture helped me to integrate into the AFMS family and gave me an avenue to turn colleagues into family. At work, this also allows doctors, DXOs and military experts to work hand in hand effortlessly, as we are not afraid to voice our opinions and share our views. It also provides an additional platform for moral and social support, which is extremely important in a high work-stress environment. As we all know, if you want to be incrementally better, be competitive. If you want to be exponentially better, be cooperative."

- CPT(Dr) Cheok Liang Jie
OC MDF, 707 Squadron



"A leader's effectiveness is often dependent on the people we recruit. The Medical Corps is made up of a bunch of people who not only complement each other's skills and talents, but are also passionate about their job. This has enabled us to achieve mission success each time."

- ME5 Daniel Chan
Formation Sergeant Major, HQ Medical Corps



"There is a strong family culture in HQMC, with great emphasis placed on welcoming and integrating new members. I have enjoyed the various events and engagement sessions which have helped me to get to know my peers and seniors better."

- OCT Joanna Goh
Year 2 Medical Student



"Help is always available when you ask for it"

- OCT Vincent Chua
Year 4 Medical Student



My wish for the future of the SAF Medical Corps is...

to be consistently updated with the latest medical advancements in technology to stay relevant & applicable in the future.

Name: **COL JUDE LEE**

My wish for the future of the SAF Medical Corps is...

for its longevity & ceaseless advancement in its capabilities to provide support to the Army & the SAF.

Name: **COL LEE SHIH WOET.**

My wish for the future of the SAF Medical Corps is...to continue to:

Seek Excellence in Medical Support;
Save lives; and
Serve the nation and be at the forefront of Military Medicine

Name: **TAN ZHI PENA NORMAN**

My wish for the future of the SAF Medical Corps is...

Be the most technologically advanced and efficient medical entity with the best people to give the utmost care to our Soldiers!

Name: **Meelee, AFMS**

My wish for the future of the SAF Medical Corps is...

To continue providing quality service to all while creating a meaningful experience for those serving under the Medical Corps

Name: **RIZWAN**

My wish for the future of the SAF Medical Corps is...

to have another fruitful 50 years!

Name: **DX9 Yan Cheng**

My wish for the future of the SAF Medical Corps is...

continue maintaining high standards of care and service to all members of the public whether during peace time or during war. And to be recognised by all and instil safety and comfort to all.
"So they may live."

Name: **CFC MUHD IZZAT BIN SULAIMI**

My wish for the future of the SAF Medical Corps is...

For medics to uphold the core value "Professionalism"
Show care, concern & compassion to patients & treat ALL patients equally

Name: **Shamal**

My wish for the future of the SAF Medical Corps is...

to never forget what we exist for, in an ever-changing world - that is to keep providing care for our servicemen and women so as to help them serve their military duties for Singapore.

Name: **Adrian Lo**

My wish for the future of the SAF Medical Corps is...

to have streamlined operations that minimise resource wastage while upholding the high standards of military healthcare services.

Name: **Cecilia Tan**

My wish for the future of the SAF Medical Corps is...

for Medical Corps to have many more 50 good years to come!
加油! SAF Medical Corps!

Name: **Pong Ai Kuan**

My wish for the future of the SAF Medical Corps is...

For us, as Medics, to continue to hone our life-saving skills and apply them in our daily lives. Our skills are not limited to only saving SAF personnel, but to all Singaporeans. I have learnt something valuable here in my 2 years as a NSF, and will be forever indebted to SAF for providing me with such a valuable skill. To seek, to save, to serve forevermore!

Name: **RIGAN TAN ZHI WEN**

My wish for the future of the SAF Medical Corps is...

Happy medical Corps Anniversary!
医者仁心!

Name: **Desmond Cheng**

My wish for the future of the SAF Medical Corps is...

To motivate one another everyday so they have the will and passion to do their best now and the coming days.

Name: **CFC TEK IN**

My wish for the future of the SAF Medical Corps is...

一 朝 的 輝 煌
全 靠 你 的 奮 鬥

Name:

My wish for the future of the SAF Medical Corps is...

Always to be ready to support the SAF & Singapore through building on the good work of our Pioneers!

Name: **Zouws Kwet**

My wish for the future of the SAF Medical Corps is...

It will be the centre of excellence for military medicine internationally. It will also be leading in terms of best practices and systems in terms of governance and management of healthcare resources within the region.

Name: **Eng Ryuk Moi Katrina**

My wish for the future of the SAF Medical Corps is...

Leave behind your legacy,
Setting the mark for the future,
Another 50 years to go!!

Name: **Mr Luo Yongxin**

My wish for the future of the SAF Medical Corps is...

Our work will continue to translate into healthier soldiers, sailors & airmen and by extension a healthier SGP.

Name: **LT(CDR) GEORNG**

My wish for the future of the SAF Medical Corps is...for it to grow as the professional corp of distinction, well respected, and ready as ever.

Name:

Cray Shan Han

My wish for the future of the SAF Medical Corps is...

To maintain an efficient yet effective healthcare. As the Senior Medix 2IC, I hope that the outstanding achievements that we attained will be maintained in the many years to come.

Name: DX6 Punitauati

My wish for the future of the SAF Medical Corps is...

Greater efficiency and effectiveness when providing healthcare services, through the provision of cutting edge medical facilities, along with skilful, passionate, and compassionate medical practitioners.

Name: NG Jianheng

My wish for the future of the SAF Medical Corps is...

that soldiers can train with the peace of mind knowing that they have the backing of a world class medical Corps.

Name:

My wish for the future of the SAF Medical Corps is...

to have a united and strong core leadership to uphold and move forward to greater heights.



Name: MES KEVIN SOH

My wish for the future of the SAF Medical Corps is...

...that we would continue to be strong, united and grow over the next 50 years

Name: Soh Teck Huen

My wish for the future of the SAF Medical Corps is...

For the future generations of medic to be more skilled and seek excellence in everything they do to hone their well developed medical skills

Name: Leong Chunth, MRIC

My wish for the future of the SAF Medical Corps is...

that the future generations will understand the importance of what we do and will continue to carry the flame.

Name: HQ, MLC

My wish for the future of the SAF Medical Corps is...

May SAF continue to prosper & succeed in providing great defence to the people of Singapore.

Name: Siti Aishah

My wish for the future of the SAF Medical Corps is...

Committed, united working force looking into the well-being of our servicemen.

LTC (DR) Robin Goh
MBBS (Spore), DFD (CAW), MMed, (Psy) (Spore), FAMS
SAF Psychiatrist
Psychological Care Centre
Military Medicine Institute (SHS)

Name:

My wish for the future of the SAF Medical Corps is...

that we will always cherish our vision and our mission - remember on the ever present need to value-add to the SAF

Name: Cheng Meng Tat

My wish for the future of the SAF Medical Corps is...

for the medical corps to be blessed with good leaders and good people.

may the people in medical corps continue to work together harmoniously

Name: Pasvine

My wish for the future of the SAF Medical Corps is...

to maintain the high standards set by the pioneers.

Name: CPL JENN YANG

My wish for the future of the SAF Medical Corps is...

Be a world-renowned contributor to global health.



Name: LCP Jerry Soh

My wish for the future of the SAF Medical Corps is...

For every subsequent generation to continue to seek excellence in training our people to become competent life savers; capable of saving lives when called upon; and serve this mandate that the SAF has given us! Seek, Serve, Sustain!

Name: MRI (DR) BENJAMIN TUNG

My wish for the future of the SAF Medical Corps is...

To stand together with other health organisations on international platform.

Name: Madelina MTC

My wish for the future of the SAF Medical Corps is...

for everyone to come together and establish strong, harmonious bonds with one another.

The unparalleled work ethic & efficiency of our colleagues will definitely make the SAF Medical Corps a premier healthcare provider and training institute for the foreseeable future. Great Job everyone!

Name:

Purwasari Samsatunani

My wish for the future of the SAF Medical Corps is...

Wishing SAF medical Corps to fly high with better & advanced equipment, staff & training.

Name: Siti Rafiah

My wish for the future of the SAF Medical Corps is...

Our medical service is lifeblood of our SAF. Continue with error free performance and nature our staff to world class standard.

Name: Thangaveloo Manjamma

My wish for the future of the SAF Medical Corps is...

SUCCESS
Some people dream of success, while others wake up and work hard at it. Fortunately, we have 'BEST OF BOTH WORLDS' to achieve **SUCCESS!!!**

Name: Lee Lee Kialu Brenda

My wish for the future of the SAF Medical Corps is...

for the corps to soar to even greater heights and for its people to always remain committed, motivated and proud to serve.

Name: Lim Hou-Boon.

“In the short span of 50 years, SAF Medical Corps has grown from service-specific entities to the massive tri-service team that it is today. Through incorporating evolving technologies and by placing importance on knowledge and skill-sets development, the Singapore Armed Forces Medical Corps will continue to be the lifeline of the SAF!

Happy 50th Anniversary, Medical Corps.”

- ME1 SHORINI DHURGA

Medical Vocational Skills instructor, SMTI



Our commitment to Seek Excellence, our passion to Save Lives and our dedication to Serve the SAF and Singapore remains strong. It has defined our legacy and shall shape our future.



The MED50 logo was created to commemorate 50 years of serving the Singapore Armed Forces and the nation. The imagery of the SAF medic tending to a casualty emphasises how the SAF Medical Corps has and remains committed to Seek, Save and Serve. The preeminent use of gold highlights the significance of this milestone in the journey of the Medical Corps. Embedded in the mantle is the theme for the MED50 celebrations: “Our Legacy, Our Future” – to reflect on the contributions of those who have come before us and to look forward in anticipation of the future. These words are etched upon a maroon-coloured background (the colour of blood), reinforcing our raison d’être – to be the Lifeline of the SAF.

SEEK

SAVE





The MED50 Mural, Our Legacy, Our Future, commemorates the Golden Jubilee of the SAF Medical Corps. It depicts the journey of transformation of the SAF Medical Corps, from the early years when the pioneers laboured to build the foundations of military medicine in the SAF, to the present times when the Medical Corps is able to provide medical support and healthcare to the 3rd Generation SAF. The future of the SAF Medical Corps - the next 50 years, will be forged by the present generation and the generations of men and women to come. Placing **life first**, the SAF Medical Corps must **dare to excel** and **remain purposeful and professional**. Together, we are committed to **Seek** Excellence, to **Save** Lives and to **Serve** the SAF.

*The MED50 Mural was unveiled by
LG Perry Lim, Chief of Defence Force,
on 28 April 2017 during the MED50 Workplan Seminar*

ACKNOWLEDGEMENTS

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We would also like to thank the following for their contributions to the book:

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PUBLISHED BY

SAF Medical Corps
701 Transit Road
Singapore 778910

DESIGNED AND PRINTED BY

Unigrow Creative Print Pte Ltd

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